

# The Electragist

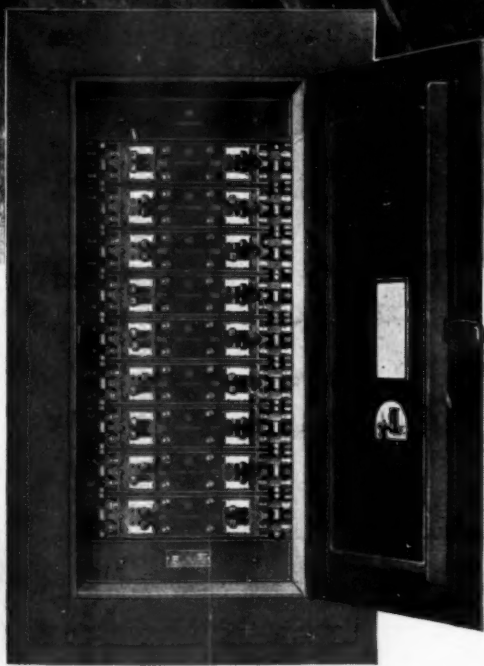
TRADE MARK REG. U.S. PAT. OFFICE

Vol. 27, No. 8

Association of Electragists  
INTERNATIONAL



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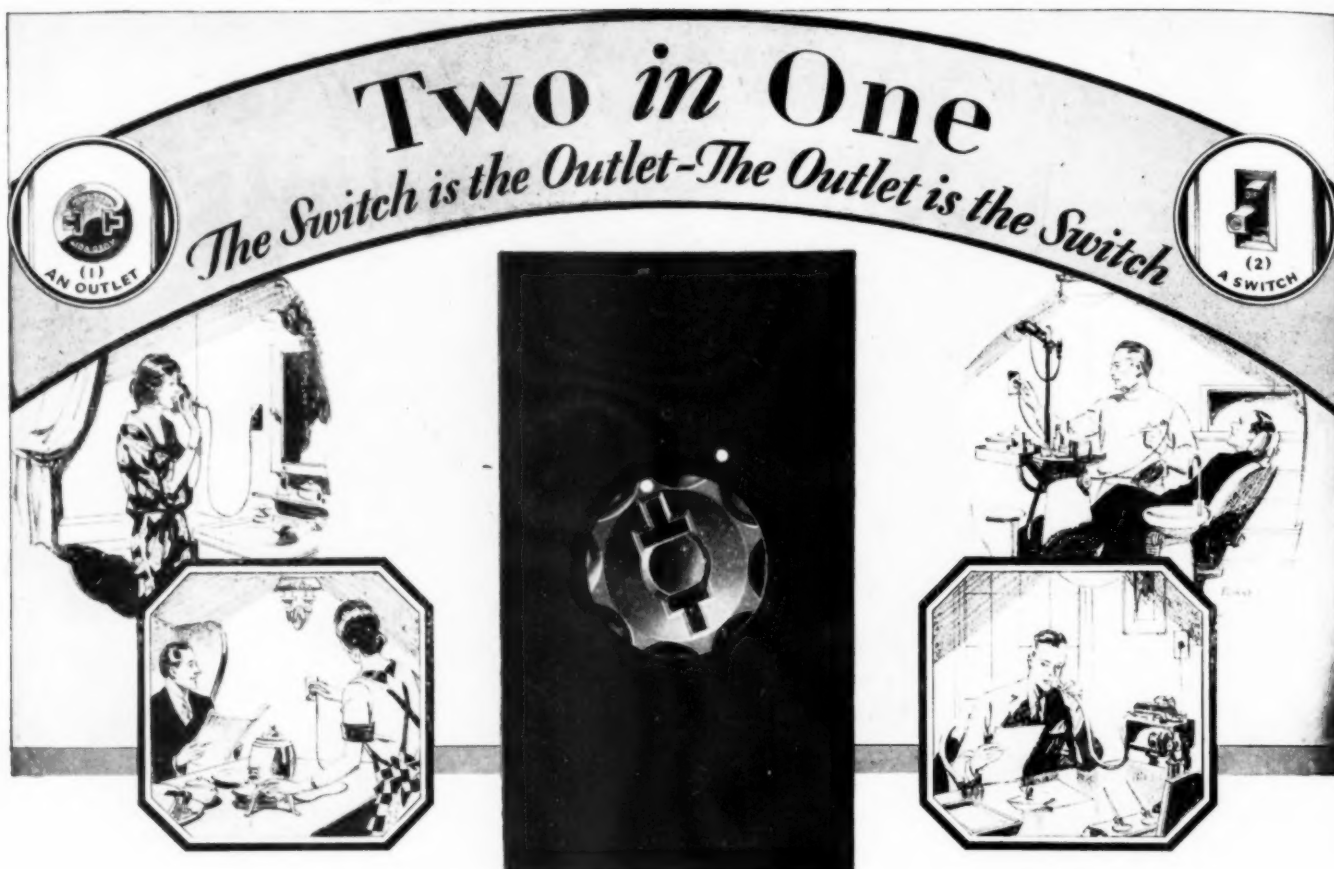
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E. 6-28



# The Electricist

(The National Electrical Contractor and The Electrical Contractor-Dealer)

Official Journal of the  
Association of Electricists—International

Vol. 27

JUNE, 1928

No. 8

Outbursts,  
Suggestions,  
Criticism

## To the Editor

Written  
by the  
Readers

### Competition

MANY letters from electrical contractors come to the editor on the subject of competition. Two interesting ones are reproduced here. What is the real situation in the contracting business? Is the competition ruinous? Or are only the unsuccessful contractors feeling the competition? Can competition be squelched by business-like methods? The editor invites practical suggestions on this subject from electrical contractors. What do YOU think about it?

There seems to prevail here a brand of competition which has been developing for the past year which I shall have to call cut-throating. Every job I figure I have to strip right down to practically wholesale on the material and *Lose the Jobs*. Even if you disregard overhead, transportation charges, depreciation, taxes, insurance, and every other item, except labor—you *Lose the Jobs*.

Is this a common complaint throughout the country?

What is the answer?

Roland E. Emery,  
Hampton, N. H.

— o —

Ten years ago in Toledo we were paying 90 cents per hour for labor and selling it for \$1.50. Since then we have been divided against ourselves and while we are paying \$1.25 per hour for labor now, we are still selling it for \$1.50 or less. While ten years ago there were 35 electrical contractors in Toledo, eight of them controlling ninety per cent of the business, now there are 240 contractors in Toledo and the eight contractors now control ten per cent of the business—and these eight are still divided and fighting strong.

One Answer to  
Competition

Our company is working out the problem from the merchandising end. We have salesmen out and are concentrating on specialties. Ventilation and floodlights are now receiving our special attention.

Things in general, however, are not altogether bad. I am eating three good meals per day and so are the wife and kiddies and we have about all there is toward making life worth living—health and happiness and the incidentals needed to enjoy them.

Marvin M. Hansen, President,  
Hansen-Lucas-De France Co.,  
Toledo, Ohio

— o —

The article by Robert A. Goeller in the April issue of THE ELECTRICIST on Job Management covers the subject most specifically, and he has taken into detailed consideration almost everything pertaining to successful operation. I would like, however, to comment on some of the points he made.

**Starting a Job:** This can't be stressed too fully. The whole life of the job depends on the attitude of all parties concerned and the co-operation that is received.

**The Foreman:** He has the only direct contact between job and office and most of the non-productive labor depends upon the foreman, how he handles the crew and what frame of mind he keeps them in. The better he handles them the greater the production.

**Job Headquarters:** A central convenient location should always be selected. Records and stock must be kept in a tidy condition. We keep all our equipment painted in a "specific shop color," all blue with orange stenciling, which is as near a blue and gold as possible in a paint job, making all equipment very visible and saving argument with other tradesmen as to whom the equipment belongs.

We charge each job with the equipment it needs, and the superintendent is responsible for its return. All ladders and lockers are numbered. We find portable shacks most convenient, of the type that bolt together, approximately 11 feet by 8 feet, by 7 feet. They can be knocked down and moved to a job within a short time and no cutting or nails are required. These, too, are painted in shop colors, which give us an advertisement on the job.

**Power Tools:** Drills, especially, are great labor savers, and help us more than anything else to keep the workmen in good spirits.

**Handling Material:** Material is always in better shape if it is delivered to the job shortly before the time required; then it is in a clean condition and conduit threads are not damaged. When material is stocked on a job it gets covered up with rubbish and refuse. On most jobs there is no delay if the warehouse is advised when and where material is required.

**Delivery of Materials:** Each class of material must be carefully checked, as it is possible to have an abundant supply on hand and then suddenly reach a point where the stock is emptied very quickly. It is essential for the stockkeeper to have a record of the work that is about to be done.

**Drilling:** Box conduit entrances, if laid out properly, are possibly the largest time savers. There is nothing more demoralizing to the workmen than to have to cut additional holes or change the size of holes, even with jiffy cutters. It is not good practice. Most boxes and knockouts can be ordered with the

specific number and size required to best fit the type of construction.

**Gathering Data:** Labor hours are very readily compiled by some workmen, while others are utterly unable to do so. The foreman on the job, if he is familiar with labor data, can readily give accurate labor costs to the office.

**Importance of Management:** The foreman cannot be too much of a diplomat. He has the most to contend with of anyone in the organization, dealing with all trades, all types of workmen, and petty whims.

**Training:** The foreman is possibly the only one who can pick his men for their own particular likes and efficiencies in the various types of installations. And if this is well done, men will get more pleasure out of their work, do a better and quicker job, and individual production will be greatly improved.

**Specialization:** Each workman has his own peculiar likes and failings for certain types of work and if they are put on work they don't like, very drastic results may follow, although their intent is quite honest. Often, too, they can do a much better job if they are familiar with the manufacturers' catalogs and the data pertaining to the materials they are handling. Also, if the men are supplied with additional changes on Code standards, and if their books are kept up-to-date, they can make installations in accordance with the latest and best practice.

George W. C. Patterson,  
Patterson Electric Co.,  
Toronto, Ontario, Canada

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I have found THE ELECTRAGIST an invaluable aid to my work, so far, although I am just a new subscriber, and I look forward to each issue.

Non Metallic  
Cable

I find the electrical estimating series a great help, although most of our work here is farm work—armored cable in the houses and conduit in barns and out-buildings. I would like to find out about the experience of other contractors with non-metallic sheathed cable and comparisons as to cost and time required for installation as compared with armored cable. Thank you for any information you may be able to furnish.

F. T. Edwards,  
Ripon, Wis.

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**Editor's Note:** We have not made any systematic effort to learn the attitude of contractors toward non-metallic sheathed cable, or cost comparisons with armored cable, but we have picked up some information as opportunity offered. A short time ago a member of our staff spent a week in the city of Syracuse, N. Y., and made considerable study of house wiring costs. Several hundred trial installations of non-metallic sheathed cable have been made in this territory. He found that the labor cost for sheathed cable is almost exactly the same as for armored cable. Sheathed cable sells there for about \$4.00 per 1,000 cheaper than armored cable. This does not amount to much on a complete job, when the cost of material and labor for switches receptacles, outlet boxes and the complete service installation is exactly the same in either case.

It would be interesting to have actual figures on a number of house-wiring installations giving direct comparisons between non-metallic sheathed cable and armored cable, and if any of our readers have such figures we would be very glad to have them.

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We are of the opinion that the establishment of a committee to give official interpretations of the National Electrical Code was a constructive activity and we regret that it is not being taken advantage of more generally.

We believe that the small number of interpretations requested has been due primarily to two causes or conditions. In the first place, we believe that a large proportion of the people who might have found a need for interpretations have not been aware of the existence of the Interpretations Committee. In the second place, those who do know of its existence have, in most cases, found it necessary to make or have a decision in the particular case under consideration within a shorter time than would be required to obtain interpretations from the officially established committee, and they have not been sufficiently interested, or have not had sufficient foresight, to go ahead and place the same question before the committee with a view to having an authoritative interpretation before the same question would arise again at some future time.

We do not believe that the small number of requests for interpretations has been due to any dissatisfaction whatever with the character of the interpretations so far given. We still believe that there is a real need and a real demand for some means of obtaining official interpretations.

If the availability of this service were made more generally known by more extensive publicity, it would probably create more interest and give the Interpretations Committee more work to do.

Carl E. Hardy, Supt.,  
Electrical Department,  
City of Oakland, Calif.

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With regard to your recent articles on collections, you may be interested in our system, which has proved very successful. We do not give a discount for quick payment and none is stated upon our invoices, and our terms are standard, 30 days net, unless otherwise specified by arrangement.

A Collection  
System

Statements are sent monthly at or about the 15th of the month.

At the expiration of 30 days, mail follow-ups are posted. The mail follow-ups are continued over a period of four months at the latest, then other steps are taken to collect the account. When necessary and advisable, depending upon the conditions involved in an account, telephone calls are then made to request the customer to send his check.

When the status of the account balance may be in question or the invoice or the inability of the creditor to definitely arrange a payment date, personal calls are then made to settle such questions as are necessary. This should not be misconstrued as applying to all cases, but only those where the amount involved is of a considerable magnitude. Our own men are detailed to this work.

At the expiration of four months, if the account is not paid, we have arrangements to place it in the hands of a collection agency which starts a mail follow-up campaign. When they have tried all amicable means to collect they immediately institute suit, upon notification from us, if advisable. Upon investigation of all the number of accounts active during the year it has been determined that it is necessary to sue for collection in less than five-tenths of one per cent.

Upon failure of the follow-ups, an investigation is made of the customer's business status, and when it is found inadvisable to sue, as nothing could be gained, the account is written off. Possibly six-tenths of one per cent of all accounts are in this class. Accounts are carried for more than one year only when there has been some definite agreement as to the eventual settlement, or where the account is being settled on a time basis. This, of course, must have a written agreement. No interest is charged on accounts due from 30 to 120 days, unless the account is placed in the hands of our collection agency or when it is necessary to sue for collection. Interest is then computed from the standard 30 day term at the rate of 6 per cent. We do not make a specialty of handling time payment accounts, but when a definite agreement is made to cover a time payment account it is covered by a note bearing interest at 6 per cent, and this is discounted.

John R. Proctor Jr.,  
John R. Proctor Co.,  
Bayonne, N. J.



# Courage of Salesmanship\*

## Analysis of the Place of the Contractor in the Electrical Industry and His Relations to the Jobber and Central Station

By LAURENCE W. DAVIS,

General Manager, Association of Electragists, International

WHAT do we mean when we say "selling the electrical idea to the public?" Certainly a lot of money has been spent to sell that idea. Perhaps the amount of money spent has lulled the industry to sleep with the thought that when we wake up the electrical idea will have been sold and the public will be clammering for our particular products. Just what does the "electrical idea" mean to the public, and what do they care about it anyway?

How successful would the steam industry be trying to sell the steam idea to the public. The manufacturers of the locomotive, the radiator, the pants-presser, the steam shovel and the facial massage boiler could not turn to the coal miners and say "Look how much more coal you would sell with one of these steam devices in use." They couldn't say that to the coal mines, for the coal mines were competing with each other to sell their particular coal at the lowest prices possible to get their share of the coal market, and they didn't have a dollar to spend doing the selling job for somebody else, to develop the other fellow's market. So each of the manufacturers of those steam products that consume coal, have had to develop "Courage of Salesmanship" and create the demand for their products through their own efforts and the offering of adequate incentive to every agency that helped them sell.

### Problems of Electricity

Electricity and coal are both natural resources requiring large investments to produce and deliver them to market. Electricity, however, cannot be delivered in trucks or paper bags, that can be carried by many types of handlers, but has to be transmitted over power lines which require rights of way along our public highways and streets, or over private property, and because duplicating lines would create many conflicts and problems and wasteful investments,

monopolies are granted to the power companies to produce, deliver, and sell electricity within their particular territory.

When these monopolies were granted the Government said "Since we are not going to let any other producer of electricity compete in this territory we must protect the public by commissions who will fix the price at which electricity will be sold, and since we are going to reserve the right to fix the price we will therefore guarantee to the companies that the price will be such that they can make a fair return upon their investments." That's when the trouble started.

### Electric Irons

Away back when a lot of you men had more hair, somebody invented an electric flat iron. It cost a lot more than the iron that your mother, and all the mothers and grand-mothers before her had used, and it looked as if it would take a lot of courage of salesmanship to sell it.

But somebody had a bright idea. Those new-fangled electric irons used considerable electricity, and it wouldn't be long before the profits on the electricity each iron used would pay for the cost of the iron.

### Who Pays?

Furthermore, the power company had been guaranteed that their rates would be fixed sufficiently above their cost of operation to guarantee them a fair return. What could be simpler? They gave away the flatiron, which went into their cost of operation, which determined the rate for current, which determined the profits on the current the flatiron used, which in due time made giving away flatirons look like a gold mine. Of course, every time anyone turned on an electric light they helped pay for their neighbors' flatirons, but since it was expected that some day everybody would have flatirons that didn't seem to be serious.

Along about 1920 the power compa-

nies were not interested in selling more current; they were having trouble taking care of the demands already created. But there were more and more manufacturers making these appliances and the earlier ones were increasing their capacities for production. So evangelists went out all over the country preaching the need for merchandising stores and thousands of electrical contractors become contractor-dealers. The central stations had never been very much interested about the margin on appliances since they didn't want to make any money on them, anyway, and so the manufacturers had never learned that dealers who must make a living out of their business must have a profit incentive to push sales. The margin on electrical appliances was kept at just the right point to lose the dealer his shirt and break his heart before he discovered the joker.

When the dealer failed and the jobber had to absorb his losses in bad debts, the central station said "Look, the electrical contractor-dealer is a failure. We will have to do the selling of appliances to the public, because now we want increased load on our lines."

But when they said "We must do the selling" they did not mean with "Courage of salesmanship," for the kind of courage only comes with the training of competition, the strengthening of sinews by hard battle, and the development of that quality of mind which enables one to encounter difficulties with firmness, without fear, or fainting of heart.

### Giving Away Appliances

The merchandising departments of the central stations in many cities have operated on the basis that electrical appliances are not worth their actual cost, and that the public will not buy them unless they are given away below cost, or some extravagant premiums or terms held out as bait. As a result the electrical dealers who are set up to serve the industry in the normal way on their ability to make a profit, are facing competition that no business can meet, be-

\*Part of an address prepared for the Westinghouse Agent-Jobbers' Association Convention, Hot Springs, Va., June 1, 1928.

cause it is outside of all the rules of normal business operations.

The electrical industry is never going to create a satisfactory public demand for its services until the industry itself gains faith that the services are worth their true cost for manufacturer, jobber and retailer.

Recently the wiring committee of the N. E. L. A. published a serial report entitled "Sell Additional Wiring." An additional wiring program should command the interest of every manufacturer, jobber and contractor-dealer. The incentive for the central station is the permanent increase in return from electrical energy sold. The incentive for the manufacturer and jobber is the increased market for materials and apparatus. But what incentive does this wiring committee report of the N. E. L. A. hold out to the contractor?

#### "Sell Additional Wiring"

The report states "the past restrictive influences responsible for the inadequacy of present wiring in a great majority of the homes are, 1. Fear of damage to property due to the carelessness of workmen or to the nature of the work involved. 2. Lack of confidence in the responsibility of the electrical contractor. 3. Cost of the installation considered too high compared to value of the convenience obtained." Is it conceivable that a program that takes as its premise such statements as that by the central stations can hold an incentive for the contractors?

#### Contractors Fail

Then the report states further that offsetting these restraining influences, under the plan of this wiring committee, "the customer feels sure that every interest will be safeguarded when he is accorded the privilege of dealing directly with the central station, or with the local electric league." The selling plan states "if sales are made directly by the lighting company the payments to the contractor will be materially less than normal price of such work in the community." There is only one way by which the payments to the contractor could be less than the normal price of such work in the community, without having those contractors fail and the jobbers carry the bag, and that is through the employment of contractors who are not operating normal contracting businesses, and who do not know that there is a cost for doing business

above their day's wage margin on the price of material and labor.

Can we build a successful market development program upon that type of contractors? If there was ever any lack of confidence in the responsibility of the electrical contractor is it going to be overcome by making the payment to the contractor less than the normal price of work in the community, so that only the incompetent will be tempted to take it through their ignorance of true costs?

The trouble with this wiring committee report is the same as their approach to the selling of appliances, or anything else, excepting their kilowatt hours to the public—they think of salesmanship as a campaign, which, by temporary high pressure sales method and special crews, with inducement prices and terms for the campaign, succeeds in mopping up a certain volume of business during the campaign without regard for the selling costs or lack of profit on the sales.

This method of getting business is most unsatisfactory and demoralizing, with destructive reactions upon sustained efforts in normal channels.

If we study the market development of other industries we do not find such temporary high pressure campaigns ever made a part of market development. The plumbing industry, the copper industry, the paint industry, etc., have all gone out and created a public demand, recognizing that the broad, permanent results of public consciousness and desire for their services is the only basis on which to build soundly.

The electrical industry has never done that. It has thought only in terms of high pressure campaigns, forcing sales through special inducements, or door to door peddling, and leaving behind each campaign an upset trade condition and no permanent advance in public thinking electrically. Such methods drive out of the field all other outlets for electrical selling, with consequent lag in the possible ultimate market development.

#### Real Development

I hope that in time the electrical industry will unanimously accept the conclusion of the industry sales conference that we need permanent market development and not campaigns. We need to develop our retail outlets through education and encouragement and not condemn them because they have failed to

develop in the face of discouragements and lack of incentive.

One of the important actions of the electrical industry sales conference was the unanimous agreement that there should be recommended the organization of broad educational work among all contractor-dealers, through the establishment of an Electrical Trade Extension Bureau, supported by the industry, and guided by a committee representing the four branches of the industry.

We cannot exploit the contractor in his necessity to make a living, by conducting campaigns at the lowest prices that the most desperate of the small contractors will accept, without destroying first the better class of those contractors whose efforts to give the right kind of service and stores to the public will not permit them to compete at such levels.

Let us have a new "courage of salesmanship." Let us as an industry have a greater faith in the value of electrical service to the public and learn to sell it for its true value. Then let us sound the call for a sales activity in which every factor will have a real incentive, and the response will bring the salesmanship the industry lacks today.

#### Checking Invoices Prevents Errors

By careful checking of invoices, both as to quantities and prices, the electrical contractor can prevent overpayments and save trouble and money. The system used by the Patterson Electric Company, Toronto, Canada, is very effective for this purpose. Each incoming invoice is stamped with the receiving date and time. Thus it is easy to tell when the invoice must be paid to get the discount. The rubber stamp impression has space for checkers to put their initials so that errors can be traced.

The requisition number is taken from the number allotted to the shipper's memo, and the original job number is put on. The person who enters the amount on the job summary sheet initials in the proper space when this is done. Quantities, prices, extensions, and totals must be checked and initialed by the man who does the checking. Errors are almost eliminated by this system; when an error is made, the responsible person can be easily discovered.



# Saving Bends With Concrete Duct

## Use of Rubber Forms for Ducts Proves Economical in Running a Large Number of Large Raceways in Congested Location

IN A large building in which electric energy is supplied from its own steam generating plant an interesting application of concrete duct was made. The generators are engine driven and are located in the basement. The original plan called for carrying the generator conductors to the switchboard in steel conduit run overhead. It was found that due to the limited basement space there would be a congestion of piping and ducts over the engines which would make it difficult and expensive to run the conduit overhead. The natural alternative was to plan them to be run under the floor, which happened to be the lowest floor.

A glance at Fig. 1, which is a basement floor plan, will show that even in this case a large amount of pipe bending would be necessary. The many bends and congested conditions suggested this as a particularly appropriate place to use flexible conduit forms. The raceways for the greatest part of the runs are in the engine foundation and therefore no special retaining forms were required.

Six 4-in. diameter ducts run from the pit under each generator to the trench behind the switchboard. Each duct to

generator No. 1 contains two 600,000 c.m., to generator No. 2 three 400,000 c.m., and to generator No. 5 two 500,000 c.m. single conductor lead covered cables. If steel conduit had been used the size for unit No. 1 would have been 3½ in. and for units No. 2 and 3 3-in.,

The flexible form or matrix consists of rubber tubing with a wall thickness of about ½ in. When tension is applied after the concrete has set the tubing contracts, and in doing so frees itself from the concrete, making it possible to pull the tubing out.

Fig. 2 shows the rubber forms in place before the concrete for the foundation was poured. The view was taken inside the foundation forms for unit No. 3 looking toward the switchboard. Only where the rubber forms pass through the foundation form are they accurately located. Between these points they are routed as convenient.

The illustration does not show the rubber forms in the final arrangement. They are temporarily hung in place until the concrete reaches a level just below the form supports. The concrete is allowed to set sufficiently to bear the weight of a man, then the wooden supports are removed and the matrices are supported on and spaced with cement blocks. These blocks determine the spacing of the ducts, which will vary with the voltage of the conductors to be installed. In this case the voltage is

(Continued on Page 24)

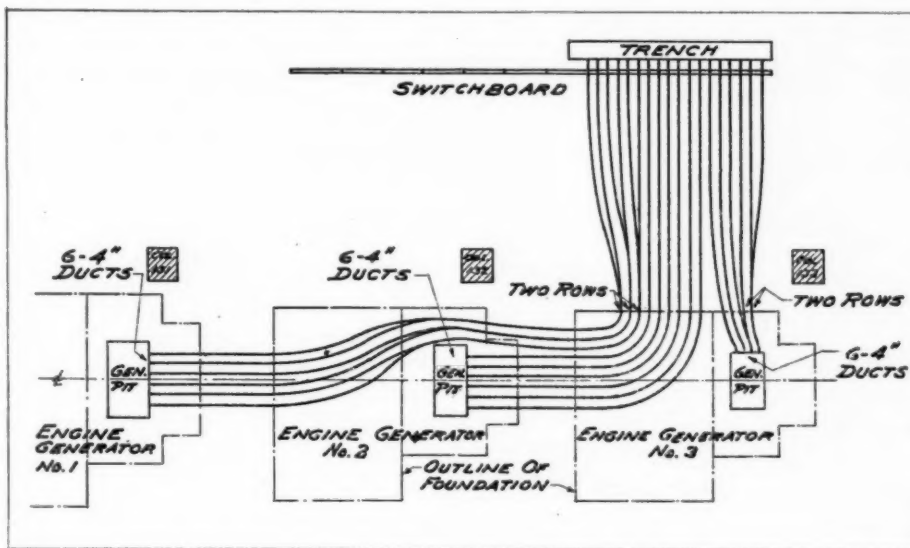


Fig. 1—Plan of Engine Room Showing Duct Runs

while actually all conduits were made 4 in. because the difference in rental for the forms is very little per foot between 3 in. and 4 in. and even less per foot between 3½ in. and 4 in. The slight increase in cost is compensated for by the greater ease with which the cables can be pulled in.

It will be noticed that a transposition of arrangement of the ducts for generator No. 1 from six ducts wide to three ducts wide and two ducts high took place between generator pit No. 1 and generator pit No. 2. Thus the six duct wide arrangement, which is desirable for handling the cables in the pit, was possible and where the contraction was necessary it was also possible to change to the three and two arrangement with little difficulty. A contraction in the run also took place where the ducts enter generator pit No. 3, due to the limited size of the pit and the direction in which the conduits must run.

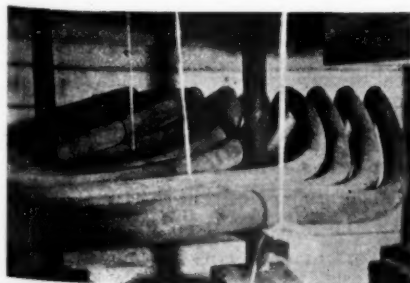


Fig. 2—View from Inside of Foundation Showing Rubber Forms in Place



Fig. 3—View from Outside of Foundation Showing Removal Tackle

*Letterheads are important because they are the first thing the recipient sees when he gets a letter. The letterhead is to the letter what the suit and necktie are to the salesman, and the impression it creates may help or hinder the sale, just as the clothing of the salesman does.*

# Letterheads

**M**ANY types and styles of letterheads are suitable for an electrical contractor, but some are better than others because they accomplish more than simply tell the name of the company. They add prestige, create confidence, or give information. All the letterheads shown were selected as illustrative of certain principles, and while few of them are perfect, no contractor would go far wrong to model his own letterhead upon any of them.

Number 1 on the opposite page is illustrated with a picture of the store, over which is printed the name and address of the contractor. The McIntosh Electric Company believes in advertising the products which it sells, on the letterhead, and this is a very good plan.

In No. 2 Rokobrant & Drake makes good use of its affiliations with the Association of Electragists, International, by putting a cut of the seal in a prominent place on the letterhead, thus giving a prestige impression to everyone who receives a letter from them.

## A Pun

Seal and Company, of Washington, D. C., has a distinctive letterhead (No. 5) which puns on its name. This is a particularly good pun in this case because the seal makes a sharp, distinct, and effective heading to the letter.

No. 4 is an example of the letterhead which carries the trademark of the firm as well as the name and address. The Electric Service Company's trademark is the monogram with a flash resembling an electric spark cutting through it. This letterhead would be more effective if the trademark were in color.

A plain and distinguished letterhead is that of C. W. Mitchell, No. 5, printed on a very good grade of paper, in bold but conservative type. When the type-written body of the letter appears beneath, a fine balance is effected and the whole letterhead gives the impression of a conservative, business-like concern.

Letterhead No. 6 is in two colors, blue and yellow and conveys the idea of the electric concern by flashing electric sparks. The hand lettered name plate gives greater distinction than the letterhead would have with a plain type name.

## Conservativeness

Another example of a plain, conservative letterhead is that of the M. H. Salmon Company, No. 7, which would be almost too plain for the ordinary contracting business. The Salmon Company, however, does business exclusively with large industrial plants and the letterhead gives to industrial executives the right impression of ability-to-live-up-to-promises.

In letterhead No. 8 is illustrated a good idea—listing in detail the services performed and the articles for sale by Engsborg's Electrical Store. Where a store sells a number of different products, correspondence about the sale of one product may help to sell some of the others, by listing them on the letterhead.

An attractive and artistic letterhead is used by the Commercial Electric Co., No. 9, which is entirely hand drawn. This type of letterhead is especially effective in writing to women. Many concerns, which do considerable merchandising, could with profit have two letterheads, one of the artistic type for women customers; the other of bolder and sturdier type for industrial concerns and male customers.

The first page of a four-page letterhead is shown, numbered 10. The letter is typed on the first and second pages, and pages three and four are used for listing testimonials and satisfied customers.

A company character and slogan dresses up the letterhead and makes it more interesting, as the owners of the Vaher & Somes Electric Company well know. Their letterhead is No. 11.

A leading product and an advertising illustration and phrase are used by the Enterprise Electrical Company to emphasize the fact that it sells electric refrigerators. This company lists the officers prominently on the letterhead, and in a small city where people are almost certain to know at least one of the officers personally, the effect on the reader is very desirable.

## Saving Bends With Concrete Duct

(Continued from Page 23)

120-240 volts and the minimum spacing of  $1\frac{1}{2}$  in. was used. The blocks are made in long lengths of 8 to 10 ft. and are broken up into pieces as required. The cross-sectional dimensions of the blocks in this case were  $1\frac{1}{2}$  in. by 2 in., either dimension being used as conditions demanded.


As soon as the rubber forms are properly spaced and blocked concrete is poured around them. Beginning at one end the concrete is poured for a depth of 1 or 2 in., for the entire length of the run, being well paddled during that time. During the time that it takes to reach the end of the run the forms have had time to adjust themselves to the stresses in the liquid concrete. Adjustments of supports and spacing can be made as the pouring progresses. In this way the entire run is buried a few inches at a time.

The matrix should be removed from 12 to 30 hours after pouring.

Fig. 3 shows the tackle arranged to pull out the matrix. A rope is slung around the rubber form in a hitch that tightens as the pull increases.

The installation is in the building of the Seaman's Church Institute, New York. The electrical contractor is Peet & Powers, New York. The patentee manufacturer and rentor of the duct forms is Murray Conduit Systems, New York.





FRANK H. BEAKES President

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# Analysis of 1928 National Electrical Code Changes

**T**HE latest, the largest and by far the most costly edition published, the 1928 National Electrical Code has received its finishing-touches at the hands of the Electrical Committee and it will probably be ready for distribution sometime during the summer.

The new Code represents a decided step in advance of the former editions, in that certain brand new features have been introduced, some sections have been entirely rearranged and rewritten, the subject matter is in general better arranged and better correlated, and the wording of many individual rules has been changed, with the net result that the requirements have been brought more nearly into

line with recent developments in the art and made much more specific.

Because of the extensive changes the task of digesting the new material and learning what the changes are will be found much more difficult than it has been when previous new editions have been published. To save time for the engineer, the inspector, the contractor, the wireman, the manufacturer and all others who must at once become thoroughly familiar with the new rules, THE ELECTRICIAN presents a complete analysis of the changes made in the old rules and of the new material incorporated in the 1928 Code. The analysis will be continued through several succeeding issues.—Editor.

## Article 1. Definitions

A term having two uses and now defined according to each use. The former definition, applying only to wiring methods, is clarified by the addition of a second clause.

**Accessible:** (As applied to wiring methods) Not permanently closed in by the structure or finish of the building; capable of being removed without disturbing the building structure or finish. (As applied to equipment) Admitting close approach because not guarded by locked doors, elevation or other effective means. (See also "Readily Accessible.")

**Approved:** The old wording "Acceptable to the inspection department having jurisdiction" is changed to read "Acceptable to the authority enforcing this Code."

**Branch Circuit:** That portion of a wiring system extending beyond the final automatic overload protective device of the circuit.

**Lighting Branch Circuits** are circuits supplying energy to lighting outlets only.

**Appliance Branch Circuits** are circuits supplying energy either to permanently wired appliances or to attachment plug receptacles, that is, appliance or convenience outlets, or to a combination of permanently wired appliances and additional attachment plug outlets on the same circuit; such circuits to have no permanently connected lighting fixtures.

**Combination Lighting and Appliance Branch Circuits** are circuits supplying energy to both lighting outlets and appliance outlets.

This definition is made necessary by the new rules in Articles 8 and 16, recognizing these three classes of branch circuits.

**Circuit-Breaker:** A device designed to open under abnormal conditions a current-carrying circuit without injury to itself. The term as used in this Code applies only to the automatic type designed to trip on a predetermined overload of current.

**Concealed:** Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them.

The last sentence is new and makes specific the application of certain rules to all raceway types of wiring.

**Conductor:** A wire or cable or other form of metal suitable for carrying current.

The change here is the insertion of the words "or other form of metal." Under the old definitions a copper bar had to be classed a non-conductor.

**Controller:** A device, or group of devices, which serve to govern, in some predetermined manner,

electric power delivered to the device governed.

A new definition which was needed. Under this definition the switch in the handle of a vacuum cleaner is a controller as well as the elaborate assembly of equipment controlling a modern newspaper printing press.

**D. C. Neutral Grid:** A well grounded network of neutral conductors formed by connecting together within a given area all of the neutral conductors of a low-voltage direct-current supply system.

**Demand Factor:** The demand factor of any system or part of a system, is the ratio of the maximum demand of the system, or part of a system, to the total connected load of the system, or of part of the system under consideration.

This is a definition adopted by the A. I. E. E. and is required because of the new demand factor rules in Article 6.

**Disconnecting Switch—Disconnect:** A switch which is intended to be operated only when the circuit has been opened by some other means.

The old rule reads "only after the load had been thrown off by some other means."

**Diversity Factor:** The diversity factor of any system, or part of a system, is the ratio of the sum of the maximum power demands of the subdivisions of the system, or part of a system, to the maximum demand of the whole system, or part of the system under consideration, measured at the point of supply.

This is another A. I. E. E. definition.

**Exposed.** Accessible; not concealed.

"Hazardous Location" is now used in place of the old term "Extra Hazardous Location." Three classes of such locations are recognized and are fully defined in Article 32.

**Hoistway:** A hoistway is any shaftway, hatchway, well-hole, or other vertical opening or space in which an elevator or dumbwaiter is designed to operate.

This obviously clarifies the rules dealing with elevators. This use of the term "hoistway" is sanctioned by the Safety Code for Elevators.

**Master Service:** The service conductors supplying a group of buildings under one management.

This term appears in Article 4.

**Motion-Picture Studio:** Any building or portion of a building in which motion-picture films are manufactured, developed, printed, rewound, repaired, stored or otherwise exposed.

**Motor Circuit Switch:** A switch used to stop a motor when at full running current, but not intended to open the motor circuit with stalled-rotor current flowing. The switch may also serve to

disconnect the motor and its controller when necessary for repairs, etc.

**Panelboard:** A single panel, or a group of panel units designed for assembly in the form of a single panel; including busses and with or without switches and or automatic overload protective devices for the control of light, heat, or power circuits of small individual as well as aggregate capacity designed to be placed in a cabinet or cutout box placed in or against a wall, or partition and accessible only from the front. (See switchboard.)

A few more words are used here than in the old definition, but no material change is evident.

**Portable Appliances:** An appliance capable of being readily moved where established practice or the conditions of use make it necessary or convenient for it to be detached from its source of current by means of flexible cord and attachment plug.

A new definition, added because of the new rules applying to portable appliances in Articles 9 and 16.

**Readily Accessible:** Capable of being reached quickly, for operation, renewal, or inspection, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, etc.

This will be recognized as the old definition somewhat amplified.

**Secondary Neutral Grid:** A well grounded network of neutral conductors formed by connecting together within a given area all the neutral conductors or individual transformers secondaries of the supply system.

Paralleling "D. C. Neutral Grid."

**Service:** That portion of the supply conductors which extends from the street main or duct or transformers to the service switch, switches, or switchboard of the building supply.

The only change in this definition is to make it more explicit.

**Special Permission:** The written consent of the authorities enforcing this Code.

**Switchboard:** A large single panel, frame, or assembly of panels, on which are mounted, on the face or back or both, switches, overload and other protective devices, busses, and usually instruments. Switchboards are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. (See Panelboard.)

The intention here is to make a more definite distinction between a switchboard and a panelboard.

**System Ground Conductor:** An auxiliary, well grounded conductor used for connecting together the individual grounding conductors throughout



a given area, but which is not a part of a circuit wire.

**Vaportight:** So enclosed that vapor will not enter the enclosure.

**Voltage to Ground:** The voltage between the given conductor and that conductor of the circuit which is grounded; in ungrounded circuits, the greatest voltage between the given conductor and any other conductor of the circuit.

On account of the numerous rules in which the voltage to ground is the governing condition, it is important to define clearly what is considered to be the voltage to ground.

It should be noted that in a grounded system the voltage between a given conductor and the grounded conductor may under some conditions differ from the voltage between the given conductor and ground.

With respect to an ungrounded system the term "voltage to ground" would be practically meaningless without a definition.

## Article 2. General

The introductory paragraph of this article contains the following statement:

Throughout this Code the word "shall" is used to indicate requirements, while the word "should" is used to indicate recommendations, or that which is advised but not required.

The old note to the effect that all conductors should be treated as bare has been dropped as inapplicable to modern wiring methods.

The following fine print note is aimed at pull-boxes and is the first effort made in the Code to discourage the use of pull-boxes for unlimited numbers of wires.

It is elsewhere provided in this Code that the number of wires and circuits confined in a single enclosure be varying restricted. It is strongly recommended that architects and others provide similar restrictions wherever practicable, to the end that the effects of break-downs from short-circuits or grounds, even though resulting fire and similar damage is confined to wires, their insulation and enclosures, may not involve entire services to premises nor interruptions of essential and independent services.

The wording of Rules 203 and 206 has been slightly changed but without change in the intent of the rules.

## Article 3. Outside Supply Conductors

An introductory note states:

The requirements of this article apply to overhead supply conductors run between buildings, upon building walls, or as line conductors which connect with interior wiring systems, or which may come in contact with such wires.

The article has been rearranged and contains all the provisions of the old Article 3, with two new sections added as follows:

### 306. Yard Wiring:

For wiring and lamps on series circuits of constant-current systems, see section 5001.

a. All wiring on exterior of building walls shall comply with the requirements for services in section 403. For circuits exceeding 600 volts, it shall be in rigid conduit or metal-sheathed cable.

b. Conduit work on the exterior of buildings shall be waterproof and shall comply with the requirements of Article 5 for interior conduit work.

c. Open wires on exterior of building walls shall be kept at least 6 inches from conductors of other supply or signal circuits not in conduit.

d. Wires strung above alleys, driveways and other open spaces shall have a clearance above ground of not less than 18 feet and if of more than 600 volts, 20 feet.

### 307. Festoon Lighting:

a. Supply shall be taken only from such points on the wiring system so that correct fusing can be provided for. Conductors shall be protected by fuses not larger than the values given in Column C of Table I, section 612.

b. The conductors of festoon streamers shall not be smaller than No. 14, and shall have an approved rubber covering. When the span of any string of lamps exceeds 40 feet, the string shall be supported by a suitable messenger wire substantially fastened at each end.

c. Festoon lighting strings or messengers shall not be attached to any fire escape or down-spout. They shall be supported by secure attachments to buildings, poles or other adequate supports by means of approved strain insulators.

d. Sockets and receptacles shall be of approved moulded composition weatherproof type, and when they are attached as pendants shall have the connections to the circuit wires staggered. All joints shall be made mechanically secure, soldered, cov-

ered with both rubber and friction tape, and painted with an insulating paint.

## Article 4. Services and Service Equipment

An old rule (401) provided that a single service supplying more than one building must be kept out of all buildings but those served, unless all the buildings served are under single occupancy or management. This is now superseded by the requirement that no single service shall supply one building through another, unless all the buildings involved are under single occupancy or management. New rules, 401 c and d, are added, as follows:

c. No building shall be supplied from the same exterior distribution system through more than one set of service conductors, unless a separate service is required for fire pumps, or for emergency lights, as required by Section 3902, or unless capacity or emergency requirements make multiple services desirable, or unless there are different transformers or sets of multiphase transformers.

d. If supplied by more than one set of service leads at the same side of a building, the service equipments shall be grouped (except for fire-pump service, which may be isolated) and the type of service separately indicated.

Open wires and multiple conductor cables on exterior of buildings, Rules 403-b and 403-c, shall not be within 8 ft. from the ground, shall not be readily accessible and shall not be subject to mechanical disturbance. Multiple conductor cables shall be supported at intervals not exceeding 15 ft.

Unless provided with metal sheath or armor they shall be mounted upon insulating supports so as to be separated at least 2 inches from the surface wired over.

Two paragraphs, d and e, have been added to section 403:

d. Open wires on exterior of buildings shall have approved rubber or weatherproof coverings for single wires and approved rubber covering for multiple conductor cables.

e. Rigid conduit systems made weatherproof shall be used for wiring on exterior of buildings where open wiring cannot readily comply with the above requirements or where the voltage exceeds 600, and may be used in lieu of such open wiring under any conditions.

Section 404, entrance, contains a number of new requirements.

Service conductors may be run through but shall not be run within a building wall unless in conduit embedded in brick, tile, concrete, or other fire resistive construction, or unless protected by fuses at the outer end of the service conduit.

A change of considerable importance is made in old rule 404-a (new rule 404-b) fixing No. 8 as the minimum size for service wires instead of No. 10. The purpose is, of course, to provide a somewhat higher degree of adequacy in small installations.

c. Where a run of grounded rigid service conduit is interrupted by metallic flexible conduit, the two ends of rigid conduit thus interrupted or the end of the rigid conduit and the service entrance cabinet if the flexible conduit shall be connected thereto, shall be bonded together by a copper wire not smaller than No. 8 using approved clamps or other approved means, and both the bonding devices and bonding wire shall, if exposed to mechanical injury, be effectively protected therefrom.

It is now required that:

Where rigid conduit is used it shall have weatherproof threaded joints and be equipped with approved service head.

**The new 1928 Code makes important changes in installation of services and service equipment.**

g. Service conduit shall be grounded unless isolated from grounded surfaces, and unexposed to contact by persons or materials which may be in contact with other conducting surfaces, and containing no wire of more than 150 volts to ground and no wire of an ungrounded circuit exposed to or connected to other circuits of more than 150 volts to ground. Conduit and metal pipe if not electrically connected to an interior conduit system, shall be considered sufficiently grounded if containing lead-sheathed cable bonded to a continuous underground lead-sheathed cable system.

### Fine print note:

It is sometimes advisable to insulate interior conduit or sheathing from service conduit or sheathing to prevent burnouts of small interior conduit, armored cable sheaths, or metal molding by large currents which might flow from exterior conduit to interior conduit and waterpipes.

In section 405, Service Equipment, a new paragraph provides that the switch blade in the grounded conductor may be omitted, where the service switch is mounted on a switchboard, as well as where the switch is mounted in a cabinet.

405-c (4) is entirely new.

(4) In buildings served through 2, 3, or 4 meters from a single set of service conductors not exceeding 150 volts to ground, the service conductors may be run to a separate switch and cutout for each meter if grouped at the point of entrance. The service run shall be continuous to the last service switch and cutout or to the bus on a switchboard, but taps may be made to the individual service switches. In installations involving more than 4 meters the entire current shall be taken through one main entrance switch.

## Service Switches

405-d reads as follows:

d. A service switch shall be enclosed and externally operable unless made inaccessible to other than qualified persons. A service switch shall be readily accessible and externally operable unless additional switches are provided for control of all individual feeders and circuits supplied through it, as recommended below.

The fine print note following is the same as in the old 405-e. This rule permits an open knife switch on a switchboard to be used as a service switch. The last clause is the same as the old rule with the addition of the words "readily accessible."

The following rule, 405-e, is new:

e. The service switch shall have sufficient capacity to rupture a current equal to the capacity of the cutout base or to the rating of other type of protective device in series with it.

This is, of course, merely the statement of a requirement which has heretofore been considered obvious.

405-g is essentially the same as the old rule, 806-b.

When the service fuses are locked or sealed or are located at the outer end of the service conduit, branch fuses connected on load side of meter shall be accessible to persons concerned and shall be enclosed in an approved casing or cabinet. If the installation consists of a single branch circuit, fuses shall be inserted in series with the service fuses and shall be of smaller capacity. These fuses need not be at the meter but shall be accessible.

This clarifies the situation with respect to the meter service switches commonly used in residences and properly belongs in this article, instead of Article 8.

The grounding of enclosures for service switches was required under general rules in the old Code for the grounding of equipment, but the rule and its exception are made much more specific by the following addition to 405-i:

The enclosure shall be grounded in accordance with the method for equipment grounding given in Article 9.

**Exception:** Grounding may be omitted where enclosures are isolated from conducting surfaces and unexposed to contact by persons or materials that may be in contact with other conducting surfaces including other enclosures, conduit, etc., and where also the voltage does not exceed 150 volts to ground and no contained live parts are connected to ungrounded circuits exposed to more than 150 volts to ground.

### Rule 405-j now reads:

j. A manually operable automatic overload circuit-breaker may be used in place of both service switch and fuse, and shall be of a type approved for this use.

The old rule did not contain the words *manually operable* and provided that *when not subject to competent supervision the circuit breaker shall be of a type specially approved for service conditions.*

The old rules 405 k and l, applying to a group of buildings supplied by a generating plant or a master service are now combined in one rule, 405 k, and made more specific. There is no material change except to add a sentence which makes the rule apply to garages and similar outbuildings of residence installations, so that the wiring in each building must be controlled by a switch.

For services in hazardous locations, this article contains only a reference to Article 32, where the special requirements for such services are covered in detail.

### Article 5. Wiring Methods

A new section numbered 500 deals with Polarity Identification of Systems and Circuits.

The old rules under "Conductors," 602-g and 611-t, called for the identification of all grounded circuit wires if they were rubber-covered and not larger than No. 8. This was the first step; the new rules go all the rest of the way and require complete identification of all grounded wires of all sizes. The manner of effecting the identification is specified in Rule 500-g.

Three classes of interior wiring systems and circuits are recognized: 1. Grounded systems and circuits with the grounded wire continuously identified. 2. Grounded systems and circuits without identified wires. 3. Ungrounded systems and circuits.

If the wiring system is in the first class, i. e., having a grounded and identified wire, this wire must be connected to a grounded conductor of the supply system.

The following systems come under the second classification:

1. A two-wire system or circuit supplied from the outside wires of an Edison three-wire system having a grounded neutral.
2. A multi-wire polyphase system or circuit with the neutral of one phase grounded.
3. A multi-wire polyphase system or circuit with the neutral wire grounded, but not used as a circuit conductor.

In these systems, also in the third class, where there is no grounded wire, no identification is required.

No single pole switch, and no automatic cutout which operates to open one wire only, shall be connected in a grounded wire, whether this wire is identified or not.

Lighting and/or appliance branch circuits shall not be supplied from auto-transformers used as balance coils.

White or gray braid was formerly required as an identification for No. 8 wires and smaller. The new rule is as follows: 500-g:

Continuous identification of wires of an interior wiring system shall be accomplished for rubber covered wires of No. 6 gauge and less by the use of continuously identified outer covering as specified in Paragraph f, of Section 602, of Article 6 of this code. For larger wires and wires of other than rubber covering, the continuous identification shall be secured either as for the smaller rubber covered wires or in process of installation by marking and testing where necessary, all continuous lengths of wires used for that polarity for which identification is required.

The following rules, 500-h and 500-i, are new:

h. Wires having white or natural gray covering shall not be used in identified systems or circuits except as conductors for which identification is required by this section.

The following method of "wiring in" single pole switches in circuits of armored cable or non-metallic sheathed cable, are suggested, as the ordinary two-wire cable having one wire identified is not permitted for single pole switch loops by the above.

1. The use of two-wire cable, if the identified wire is rendered permanently unidentified by painting, or other effective means at every point where outlets, switch boxes, junction boxes or pull boxes make the wires visible and accessible.
2. The use of a three-wire cable having one identified wire, which identified wire is cut off at each end of the section of cable where

## A number of important changes in wiring methods have been made by the Code committee.

the wire emerges, or which is in some manner properly marked at each end to show that the identified wire of this cable is not in the circuit.

3. By so arranging the wiring that both conductors of the circuit coming from the distribution point pass through the switch box to the outlet.

i. Where pendants are attached to a wiring system containing an identified wire, that conductor of the flexible cord which is connected to the identified wire of the system shall itself be continuously identified, as specified in Paragraph f, of Section 609, of Article 6 of this code. This identified conductor of the cord shall be connected to the screw shell terminal of any lamp holder attached thereto. It is recommended that flexible cords to portables be similarly identified and connected.

Section 501, *Open Wires*. Asbestos-covered wire, Type A, is added to the types approved for open work. 501-f, is a new rule:

f. Wires entering or leaving buildings or rooms subject to moisture or corrosive vapors shall have drip loops formed on them and shall then pass upward and inward from the outside of buildings, or from the room, subject to moisture or corrosive vapors, through non-combustible, non-absorptive tubes.

The following rule, 501-q, replaces old rule 501-s:

1. Open wires in accessible attics or roof spaces, shall be installed as follows:

(1) When run within five feet of the floor or floor joists, through bored holes in rafters or studs, or when run through bored holes in floor joists, wires shall be protected by substantial running boards extending at least one inch on each side of the wire, and securely fastened in place.

(2) When within five feet of floor or joist, across the face of rafters or studding, or across the top or face of floor joists, wires shall be protected by substantial guard strips at least as high as the wires.

(3) When carried along the sides of rafters, studs or floor joists, neither guard strips, nor running boards shall be required.

The section has been entirely re-arranged but with the two exceptions noted, there are no important changes in the requirements.

Section 502, *Concealed Knob and Tube Work*.

Rule 502-a states that this type of wiring may be installed in the hollow spaces of walls and ceilings, and Rule 502-b limits its use to systems of not more than 300 volts between conductors and not more than 150 volts to ground.

The old rule, 502-d, giving specifications for flexible tubing, is omitted. These are specifications of the Underwriters' Laboratories which are available to all interested parties, and it is not considered necessary to include them in the Code.

In Rule 502-f, old Rule 502-e, permitting fished work, non-metallic sheathed cable is mentioned as an alternate type of wiring as well as conduit and armored cable.

Rule 502-i, corresponding to old 502-h, omits reference to outlet plates, as these are no longer approved and requires outlet boxes at all switch points as well as at all outlets.

With the above exceptions, there are no changes in this section.

Section 503. *Conduit Work*. This section now covers both rigid and flexible conduit.

Conduit of other material than steel is recognized in Rule 503-b, which states that rigid conduit, elbows and couplings:

Shall, unless made of non-corrodible metal, be suitably protected against corrosion inside and outside, excluding threads at joints, by an approved coating of corrosion-resistive material such as zinc, or enamel, or by combinations of both.

503-c includes the same requirements for flexible conduit as stated above for rigid.

Where the old rule, 503-c, read "rigid conduit shall be in 10-ft. lengths," the new rule, 503-e, is changed to read "rigid conduit shall be in 10-ft. lengths, including couplings." Rigid conduit is not made in 10-ft. lengths. If a coupling is screwed on one end exactly the right distance, the over-all length will be 10-ft.

In place of the former requirement that the inside radius of any elbow shall not be less than 3 1/2 in. Rule 503-f states:

The radius of the curve of the inner edge of any bend shall be not less than six times the internal diameter of the conduit. Care shall be taken to see that bends in conduit are so made as to avoid reducing the internal diameter of the conduit at the bend.

### Conduit Fittings

Rule 503-g has the following new sentence:

The fittings connected to more than one run of conduit shall be so designed and connected that adequate electrical continuity from one conduit to another will be secured.

The requirement that all ends of conduit shall be reamed is now written into the Code in Rule 503-j

Lead covered wire is required in flexible conduit in wet or damp places (503-l).

Contractors will be pleased with the more definite statement made in 503-m (see 503-j in old Code).

m. Wires shall not be drawn in until all mechanical work on the building which is liable to injure the wires has been completed, as far as possible.

No change is made in the tables of conduit sizes for various sizes and numbers of wires nor in the requirements for supporting wires in vertical conduits. The old rule, 503-c, in the 1926 Supplement limiting the deflection of wires in a gutter, becomes 503-s and is the same in effect but wire sizes are stated instead of ampere capacities of terminals.

Section 504. *Surface Metal Raceways (Molding Work)*.

The voltage limitation for raceway work now calls for not over 150 volts to ground as well as not over 300 volts between conductors. Raceways must not be used where corrosive vapors are present. These changes are found in Rule 504-b.

Asbestos covered or slow burning wire are permitted in metal raceway, where the temperature exceeds 120° F.

Old Rule 504-f is replaced by the following:

504-d. Surface metal raceway shall not be used for wire larger than No. 8 nor for a number of wires greater than that for which the raceway is approved and in no case for more than nine wires.

Rule 504-g, requiring all wires of an A. C.



circuit to be in one raceway, is the same as the rule of the same number in the 1925 Code. The exception made in the 1926 Supplement in favor of concealed extensions is now omitted.

Metal raceway must be securely fastened in place.

Rule 504-i states that metal raceway shall be grounded as prescribed in Article 9 of this Code, but omits the wording in the old rule "and at a point as near as practicable to the source of supply." The exception given in the old rule is covered in Article 9.

Rule 504-i on combination metal raceways, contains two changes. The separate compartments must be identified by sharply contrasting colors, and wires of light and power systems must enter and leave the raceway only by means of conduit work.

### Armored Cable

**Section 505, Armored Cable.** A considerable part of this section is new. The "where" provisions are covered under the three following rules, b and c being entirely new and i being a revision of old Rule 505-d.

505-b. Armored cable shall not be used for systems of more than 600 volts nor where its surrounding temperature will exceed 120 degrees F. (49 degrees C).

505-c. Type AC armored cable may be used for open or concealed work in dry locations and may be fished; when run on walls of brick or similar masonry, it may be embedded in the plaster finish.

505-j. Type ACL (having a lead sheath under the armor) shall be used in underground service runs and where other circuits are embedded in masonry, concrete or fill in buildings in course of construction, and elsewhere, if the location is such that the cable will be exposed to the weather or to continuous moisture or dampness.

Rule 505-e as follows, contains some new requirements and makes certain old requirements considerably more definite.

Approved outlet boxes or fittings shall be installed at all outlets and switch points as required by Paragraphs a and b of Section 703. The cable shall be continuous from outlet to outlet or from fitting to fitting and the armor shall be mechanically and electrically connected to all fittings in a manner to close the openings at entrance points and to hold the cable securely. The entire cable system shall be secured in place by approved fastenings.

Other new installation rules, 504-f, g, and i, include the following provisions:

When cable is run through holes in wood timbers the holes must be bored two inches or more from the edge of the timber, if possible.

**When cable is installed in accessible attics.** If run through rafters, studs or floor joists and within 5 ft. of the floor, it must be protected by running boards. If run across the face of rafters, studs or floor joists and within 5 ft. of the floor it must be protected by guard strips. If run along the sides of rafters, studs or floor joists neither running boards nor guard strips are required.

At all points where the armor terminates, additional protection shall be afforded to the conductors by approved connectors or clamps and shall be adequately bushed.

Rules 505-l, wires of A. C. systems in armored cable, and 505-m, grounding, are changed in the same manner as the corresponding rules for metal raceways.

**Section 506, Underfloor Raceways.** This section is only the second step in the development of rules for this type of wiring and quite naturally the wording and arrangement differs considerably from the first set of rules, published in the 1926 Supplement. Most of the actual changes have to do with details of installation. The more important of the changes are noted below.

Underfloor raceways shall be used only in locations free from corrosive, hazardous and

extra-hazardous conditions. They may contain wires as large as No. 8, protected by an automatic overload protective device not exceeding 30 amps. The limiting number of wires is 10, as before, but not more than 30 per cent of the cross-sectional area shall be occupied; the latter provision, however, does not apply to armored cable.

The upper surface of flat top ducts shall not be more than 4 in. wide. Flat top ducts placed side by side must have 1-2 in. of concrete between them, unless the concrete covering is increased from the normal 1 in. to a thickness of 1 1-2 in. Metal raceways shall be electrically continuous with junction boxes and inserts.

Signal wires or other wires of different systems may not be run in the same compartment with wires for light, heat or power circuits.

The old rule is omitted which required that junction boxes shall not be used as outlet boxes and that the distance between junction boxes shall not exceed 60 ft.

### Section 507, Non-Metallic Sheathed Cable.

The use of this material is restricted, as previously, to circuits not exceeding 300 volts between conductors, with the additional limitation of circuits not exceeding 150 volts to ground.

Under Rule 507-b, it is approved not only for use in residences, but also:

For the wiring of office or mercantile occupancies in residence neighborhoods, which individual occupancies do not require more than four branch circuits.

It must not be installed (Rule 507-c):

In masonry, concrete or fill in buildings in course of construction, nor where exposed to the weather, nor in continuously damp or moist locations.

The maximum wire size is increased from No. 6 to No. 4. In addition to the circuit wires the cable:

Shall have an approved size of non-insulated copper conductor laid in next to the insulated conductors, to be used only for grounding purposes.

This grounding conductor is made necessary by a new rule in Article 9, requiring the grounding of fixed equipment, including outlet boxes, lighting fixtures, metal switch plates, etc., in moist, corrosive and conductive locations.

The grounding conductors shall be connected to the boxes or fittings by approved means such as binding screws, clamps, or lugs located within the boxes or fittings.

### Exposed Wiring

When employed for exposed wiring, the cable shall closely follow the surface wired over, unless running boards are used. Fastenings must be spaced not over 3 ft. apart, instead of 4 ft., as previously required. The old rules required protection of all cable within 5 ft. of the floor by a wood or metal strip; the revision calls for protection by a wood or metal strip or by pipe, except where a horizontal run is protected by fixed furniture. The old rule which prohibited running cable along a wall nearer than 6 in. above the floor is omitted.

For concealed wiring the requirements are the same as before except that old Rule 506-e-1 is omitted:

Shall be used only in dry places; in wood joist or stud partitions, floors or walls.

Also it is provided that fastenings may be spaced 4 1-2 ft. apart, instead of 4 ft.

In all cases the cable must be secured to boxes or terminal fittings by devices which substantially close the openings. This is merely a repetition of the general rule 703-l. The rule that the protective covering must not be injured by bending is made more spe-

cific by the additional provision that no bend shall have a radius less than five times the diameter of the cable.

New rules for the protection of non-metallic sheathed cable in accessible attic, 507-l, are identical with the rules for open wiring and for armored cable in these locations, 501-q and 505-g.

It was formerly required that cable in unfinished basements be run on running boards where crossing joists. It is now made allowable to run the cable through holes bored in the joists, Rule 507-m. Three-wire assemblies larger than No. 8 may be run across the joists without using running boards.

### Metallic Tubing

#### Section 508, Electrical Metallic Tubing.

This is a new wiring material, which is threadless and has a much thinner wall than rigid conduit. It is approved in 1-2 in., 3-4 in. and 1 in. nominal sizes, having the same inside diameter as the corresponding sizes of rigid conduit. It is also approved in a nominal size of 3-8 in. for underplaster extensions only.

The tubing must be so made that it may be readily distinguished from rigid conduit after it is installed. It must be made of non-corrodible metal or protected from corrosion. Connections shall provide adequate mechanical strength and electrical continuity and the tubing shall not be threaded, the latter requirement being essential because the light wall of the tubing would be greatly weakened even by cutting a special fine thread. Elbows and bends must have an inner radius not less than six times the internal diameter of the tubing.

The tubing shall not be used for wiring systems of more than 300 volts between conductors or more than 150 volts to ground, nor for wires larger than No. 8 or fused at over 30 amps. The number of wires allowed in one run is the same as for rigid conduit.

This type of wiring shall be used only in exposed dry locations, where, during installation or afterwards, it will not be subject to severe mechanical injury nor to corrosive vapors.

Rules for number of bends in one run, completeness of raceway, type of wire to be used, time of pulling in wire, use in an A. C. system, wire supports in vertical runs and grounding are the same as for metal molding.

#### Section 510, Underplaster Extensions. (Concealed).

In Rules 503-b and 505-b in the 1925 edition and 504-g in the 1926 Supplement, approval was given to the use of 5-16 in. rigid or flexible conduit, or metal molding containing one wire, and single conductor armored cable, for extensions from existing outlets in buildings of fire-resistive construction, these extensions to be laid against the fire-proofing and plastered over.

All rules for this class of work are now grouped in Section 510. Its use is limited to lighting branch circuits, combination lighting and appliance branch circuits, and ordinary and medium-duty appliance branch circuits, which terms are explained in the Definitions, Article 1 and further in Article 16. The material may be rigid conduit, flexible conduit, armored cable, electrical metallic tubing or metal moulding. Rigid or flexible conduit or tubing may be not smaller than 5-16 in. A single conductor may be installed in the conduit, tubing or moulding or cable even when alternating current is used. As formerly required, such extensions may not be run outside of the floor or suite in which they originate.

**Section 512. Auto-Transformers.**

Auto-transformers may not be used to supply any interior wiring system unless the system contains an identified grounded conductor which is solidly connected to a similar identified grounded wire of the system supplying the auto-transformer.

The statement is added that this rule does not prohibit the use of auto-transformers in motor control apparatus nor for supply circuits wholly within a device which also contains the auto-transformer.

**Section 511, Decorative Lighting Systems.****Section 513, Insulation Resistance.**

No change has been made in either of the above two sections.

**Section 514, Surface Wooden Raceways (Molding Work).**

This section is old Rule 504-b repeated with appropriate installation items added.

**Article 6. Conductors****Section 601, Marking.**

In order to avoid confusion with the requirements for identification of grounded wire, Rule 601-a has been changed to read:

a. Wires, cables and cords of all kinds, except weatherproof wire, shall have a continuous distinctive marking so that their maker may be readily identified.

The old rule reading "so that they may be readily identified." The same change has been made in other similar rules. Asbestos-covered switchboard wire is included as one of the types which need not be tagged showing the maximum working voltage.

**Section 602, Rubber-Covered Wire.**

The old Rule 602-a, requiring that all conductors be tinned is omitted as being a manufacturing requirement, but the tinning is still required by the Underwriters' Laboratories specifications.

Consistent with Rule 500-g, the sizes of wire which must be identified by a white or gray braid are No. 6 and smaller, instead of No. 8 and smaller. This is Rule 602-f. Instead of one identified conductor in multiple conductor cable, the rule now reads:

Twin and twisted pair wires and three-conductor cables shall have one conductor, and four-conductor cables shall have two conductors identified in this manner.

**Section 603, Varnished-Cambric-Covered Wire, Type VC.**

The former rule stating that this insulation shall not be used where exposed to moisture is replaced by a fine print note to the effect that this insulation is not intended for use where moisture exists.

Varnished cambric insulation has been developed and standardized to meet the demands of central stations rather than for use in interior wiring. For voltages higher than 600 volts, wire manufacturers' standards for insulation thickness differ slightly from the standards for rubber insulation and for this reason a new insulation thickness table is included in this section conforming with the manufacturers' standards.

The note in old Rule 606-d, making recommendations as to the use of varnished-cambric-covered wire is omitted, and the rule for tests, 606-e, is also omitted.

**Section 604, Asbestos-Covered Wire, Type A**

This is a new section and contains practically nothing but a fine print recommendation as follows:

This wire is especially useful in hot, dry places where ordinary coverings would perish, and where wires are bunched as on the back of a large switchboard or in a wire tower, so that the accumulations of rubber covering would result in an objectionable large mass of highly inflammable material. It is not suitable for outside work or where moisture exists.

**Section 605, Slow-Burning Wire, Type SB.**

The only change here is the addition of one sentence to the fine print note. This reads:

It is not suitable for outside work or where moisture exists.

**Section 606, Slow-Burning Weatherproof Wire, Type SBW.**

In Rule a of this section, referring to the covering on the wire, the word "weatherproof" is changed to "weather-resistive" and "fire-proof" is changed to "fire-retarding." Otherwise there are no changes.

**Section 607, Weatherproof Wire, Type WP.**

The new rule omits the specifications for the thickness of the covering. There is no other change.

**Section 608, Fixture Wire.**

Types of fixture wire are listed as follows:

Type AF asbestos covered wire.  
Type RF-64 rubber-covered fixture wire—1-64 inch insulation.

Type RF-32 rubber-covered fixture wire—1-32 inch insulation.

Type RF rubber-covered fixture wire—3-64 inch insulation.

Type SBF slow-burning fixture wire.

For rubber-covered types the requirements for the rubber and outside covering are unchanged except that the thickness of the rubber must be not less than 3-64 in. on No. 14.

The two following rules are new:

b. If stranded conductor is used, the strands shall be braided, laid up concentrically or rope stranded or shall be covered with a tight close wind of fine cotton.

d. The covering of type SBF fixture wire shall consist of two braids of cotton or of other thread, all the interstices of which shall be filled with material having fire-resisting and insulating properties. Its surface shall be finished smooth and hard. Outer coverings of braided cotton or silk may be provided.

**Section 609, Flexible Cords.**

The table on Page 46 in the old Code has been enlarged and rearranged and the supplementary specifications for the use of cords, old Rule 603-d, sub-paragraphs 1 to 11, are now omitted.

In Rule 609-f, it is required that one conductor of flexible cords shall have a continuous identifying marker.

**Section 610, Armored Cable.**

This is the same as Section 605 in the old Code, except that Rule b reads:

b. The cable shall have a continuous distinctive marking so that the maker may be readily identified.

**Section 611, Non-Metallic Sheathed Cable.**

This section is entirely new. It is as follows:

a. The conductors shall comply with the requirements for rubber-covered wires, except that no braid need be provided directly over the rubber covering.

## The most radical innovation is the section on Demand Calculations for Feeder Sizes.

b. Cable shall be of approved type, in sizes 14 to 4, inclusive, and in two or three-wire assemblies and in addition shall have an approved size of non-insulated copper conductor laid in next to the insulated conductor for grounding purposes.  
c. The cable shall have a continuous distinctive marker so that the maker may be readily identified.

**Section 612, Carrying Capacity of Conductors.**

The only change here is the sensible substitution of the word "Column" for "Table" in column headings in the tables of carrying capacities I and II.

stitution of the word "Column" for "Table" in column headings in the tables of carrying capacities I and II.

**Section 613, Demand Calculations for Feeder Sizes.**

This is the most radical innovation in the new Code and is, of course, entirely new.

In determining the current which a wire will be required to carry and the size of wire approved for carrying that current, demand factors may be applied:

(1) To certain specified classes of lighting loads.

(2) To range loads.

(3) To power loads.

A special demand factor may be applied to the neutral conductor of a lighting feeder under certain conditions.

The data presented in this section is the result of a very careful study made by a technical sub-committee. The method employed is unquestionably right and it is very probable that the data will fit the great majority of installations. However, it is also very probable that here and there a few instances will be found where conductor sizes calculated from this data will be too small. In such a contingency, the "authority enforcing this Code" is relieved of responsibility by the following saving clause:

If at any time after the equipment is put in service it shall be found that conductors are of insufficient capacity to carry the actual load without over-fusing, they shall be increased to comply with the requirements for overload protection applying thereto.

**Lighting Loads.** For the classes of lighting loads covered, the general method is as follows:

The actual connected load, number of branch circuits and number of outlets are disregarded entirely, and all calculations are based on a standard loading for each class stated in terms of watts per square foot of floor area or watts per lineal foot (for show windows, etc.). A limit area is stated for each class, and a demand factor of 100 per cent is applied to the load in this area, determined by multiplying the area in square feet by the standard load in watts per square foot. In residences, office buildings, hospitals, schools and warehouses, a demand factor specified for each class is applied to the standard load in the area in excess of the limit area. In hotels there are three steps instead of two as in the above cases and in apartment buildings there are four steps.

The load to be carried by a feeder serving only a part of a building is determined by applying the data to that part alone; that is, the area of this part of the building must be found and a 100 per cent demand factor is applied to the standard load in the limit area, then the specified demand factors are applied to the load in the remaining area in excess of the limit. To determine the load for the service conductors the calculation is made for the building as a whole.

In applying this data:

The word "Area" means gross area, which shall be determined by the outside dimensions of the building and by the number of floors. Unoccupied cellars, unfinished attics, and open porches need not be included in this computation.

The standard loads, limit areas and demand factors for all classes of lighting loads where a demand factor less than 100 per cent may be applied, are given in Table I.

**Examples**

The following examples illustrate the application of the table. In these examples the 2-wire system has been used solely for simplicity of illustrations. The same general method of calculation may be applied to other systems of distribution, such as 3, 4 or 5-wire.



## Example No. 1

A dwelling having an area of 4500 square feet, exclusive of unoccupied cellars, unfinished attics, and open porches.

AREA IN SQUARE FEET, 4500  
 1 watt—sq. ft. = 4500 watts  
 Allowance for appliances = 1000 watts

COMPUTED LOAD = 5500 watts

DEMAND SELECTED FOR THIS OCCUPANCY,  
 first 2000 square feet—Demand 100. Excess above 2000 square feet—Demand 60.

4500 square feet area  
 —2000 square feet at 1 watt per sq. ft. = 2000 watts  
 100% = 2000 watts

2500 square feet at 1 watt per sq. ft. = 2500 watts  
 60% = 1500 watts  
 Allowance for appliances = 1000 watts

LOAD AFTER APPLYING DEMAND 4500 watts

For 110-volt, 2-wire system:

4500 watts ÷ 110 volts = 40.9 amperes.

SIZE OF CONDUCTORS = 2-No. 6.

(From table No. 612 of allowable carrying capacities of wires).

For 220-volt, 2-wire system:

4500 watts ÷ 220 volts = 20.45 amperes.

SIZE OF CONDUCTORS = 2-No. 10.

(From table No. 612 of allowable carrying capacities of wires).

For 110-220-volt, 3-wire system:

4500 watts ÷ 2x110 volts = 20.45 amperes.

SIZE OF CONDUCTORS = 3-No. 10.

For 110-220 volts, 4-wire, 3-phase system:

4500 ÷ 3x110 volts = 13.63 amperes.

SIZE OF CONDUCTORS = 4-No. 14.

(From table No. 612 of allowable carrying capacities of wires).

The above calculation does not take account of ranges or other appliances using more than 1650 watts each.

## Example No. 2

Multi-family dwelling having an area of 30,800 square feet with 44 apartments. Meters in the cellar in two banks of 22 each, and individual sub-feeds to each apartment.

AREA IN SQ. FT. per apt. 700

1 watt per sq. ft. = 700 watts

Allowance for appliances = 1000

COMPUTED LOAD per apt. = 1700 watts

DEMAND 100.

1700 ÷ 110 volts = 15.4 amps., therefore for each apt. feeder from meter bank the SIZE OF CONDUCTORS IS No. 12 for each of two wires.

## SUB-FEEDS

AREA IN SQ. FT. supplied through each meter bank:

22 apts. of 700 sq. ft. each, 15,400—at 1 watt per sq. ft. 15,400 watts

Allowance for appliances = 22,000 watts

COMPUTED LOAD = 37,400 watts

Demand selected for this occupancy:

For first 2000 sq. ft., 100% = 2000 watts

For area in excess of the first 2000 sq. ft., 60% of 35,400 = 21,240

Load after applying Demand = 23,240

23,240 ÷ 110 volts = 211 amperes; therefore, from service to each meter bank, SIZE OF CONDUCTORS, from table No. 612, is—

No. 4/0 for each wire.

## MAINS

AREA IN SQ. FT. 700x44 = 30,800 sq. ft. at 1 watt per sq. ft. = 30,800 watts

Allowance for appliances 44x1000 = 44,000 watts

COMPUTED LOAD = 74,800 watts

DEMAND SELECTED for this occupancy for first 2000 sq. ft., 100% = 2,000 watts

For area in excess of first 2000 sq. ft. 50% of 72,800 = 36,400 watts

LOAD AFTER APPLYING DEMAND = 38,400 watts

38,400 ÷ 110 volts = 349; therefore, from the service supply to the cutout where the main is divided into two feeders, one to each meter bank, the SIZE OF CONDUCTORS, from table 612, is 450,000 C. M. each.

The above calculation does not take account of ranges or other appliances using more than 1650 watts each.

In Rule 613-e permission is given to combine the neutral conductors of lighting feeders as follows:

One neutral conductor may be employed for three sets of 3-wire or two sets of four or five-wire interior feeders. Where single two-wire final circuits are run from a meter bank to the

premises of individual tenants, the circuits may be balanced on each side of the system and a common neutral be employed for not more than eight circuits on 3-wire direct-current or single-phase, and 5-wire, 2-phase alternating-current systems, and not more than six circuits on 4-wire, 3-phase systems. All wires of the A. C. systems shall be run in the same conduit.

The size of the neutral conductor is in every case to be arrived at by applying the same data as explained above, i. e., the size of the neutral will be based on the specified loads and demand factors, except that when the load

in the outside conductors, computed in this manner, exceeds 200 amperes, an additional demand factor may be applied as per Table II.

The additional demand factor for the neutral is based on the assumptions that a fuse in an outside conductor will only blow at or near full load, and that at full load on a lighting feeder the part of the building served will be fully occupied, hence the blown fuse will be replaced inside of 30 minutes. The larger sizes of cables will carry about 140 per cent of their rated capacity for 30 minutes before reaching a temperature which will injure the rubber insulation. If the carrying capacity of the neutral in a 3-wire system is made 70 per cent of the capacity of the outside wires, 140 per cent of the neutral capacity will approximately equal full load for the outsides.

In the case of a 5-wire 2-phase system, the worst possible condition is two blown fuses, one in an outer conductor of each phase. This may leave the system operating as a 3-wire 2-phase system, in which the conductor intended to be the neutral becomes a common return for the two phase wires and carries 141 per cent of the current in the other wires. This neutral, if of small size, should therefore have a carrying capacity 40 per cent greater than that of the outside wires. Apply-

(Continued on Page 34)

TABLE 2—ADDITIONAL DEMAND FACTORS FOR NEUTRALS

System	Current Load in Outside Conductors After Applying Demand Factor	Further Demand Factor for Neutral Conductor
3-wire, D.C. or one phase, and 4 wire, 3-phase	0 to 200 amperes	100%
3-wire, D.C. or one phase, and 4-wire, 3-phase	above 200 amperes	70%
5-wire, 2-phase	0 to 200 amperes	140%
5-wire, 2-phase	above 200 amperes	100%

TABLE I—STANDARD LOADS AND DEMAND FACTORS FOR LIGHTING

OCCUPANCY	Standard Load—Watts per Sq. Ft.	Limit Area—Sq. Ft. 100% Demand Factor Applied	Demand Factor for Load in Excess Area
Single Family Dwellings 1000 watts allowance for appliances to be added to standard load, with demand factor of 100 per cent.	1.0	2,000	60%
Multi-Family Dwellings (other than hotels) and apartment Hotels having provision for individual electric cooking An allowance of 1000 watts per apartment allowance for appliances to be added to standard loads and demand factor to be applied to this. 1 to 10 apartments..... 11 to 40 apartments..... Over 40 apartments.....	1.0	2,000	70% 60% 50%
Hotels having no provision for individual electric cooking (Standard loading does not apply to ballrooms) Area from 10,000 to 50,000 sq. ft..... Area over 50,000 sq. ft.....	1.0	10,000	80% 70%
Stores (excluding case and show window lighting) Counter Cases—25 watts per linear foot. Wall or Standing Display Cases—50 watts per linear foot. 100 per cent Demand Factor for all loads.	2.0		
Show Window Lighting—200 watts per linear foot measured horizontally; 100 per cent Demand Factor for all loads.			
Office Buildings	2.0	10,000	70%
Industrial Commercial (Loft) Buildings. (A building of more than one floor, used for manufacturing or merchandising, occupied by more than one tenant.) 100 per cent Demand Factor for all loads.	1.0		
Garages, exclusive of machine shop and display rooms 100 per cent Demand Factor for all loads.	.5		
Hospital, exclusive of operating rooms and X-ray department	.75	25,000	60%
Schools	1.5	10,000	50%
Storage Warehouses	.25	50,000	50%
Factories— (A building or portion of a building occupied by one tenant and used for manufacturing.) No standard load. No Demand Factor data.			

# CREDIT\*

## The Problem of Credit in the Relations of Contractor-Dealers and Jobbers

By J. J. O'REILLY

Credit Manager, Graybar Electric Co., Inc., Los Angeles, Calif.

WHEN the Contractor can spare a moment from his busy life with its internal problems of unfair competition, cut prices, and the thousand other ills, and has an opportunity to exchange ideas with some of his friendly fellows, the unfailing question is: "What's the matter with the jobber?"

WHEN the jobber at rare times can get away from his own internal problems, and tries to spot the high-lights of the industry, the question with him that will not down is: "What in the world is the matter with the contractor-dealer?"

THERE you have both sides. If this were a true and complete picture, you would have the paradox of both being right and both being wrong. In spite of firm convictions on each side, one sees only the mote in the eye of the other, but not the beam that may be in his own. "I'm all right, by and large—it must certainly be the other fellow." If there be any such picture as this, both ideas are travelling in a vicious circle, and logic tells us that such a line of reasoning gets no one anywhere. The idea of the dog chasing his tail, while ordinary, certainly brings the example strongly home to us. Let us, therefore, approach the question in all its angles frankly, honestly and logically, and thus enhance our prospects for reaching a real conclusion and getting somewhere.

The legitimate contractor-dealer is entitled to a fair and honest profit for his work—he does not expect more and should not receive less. He should be prosperous, happy and successful as a result of such fair and honest profit from his labors. The jobber deserves the same, should enjoy a successful business from successful contractor-dealers, and be able to perform in a profitable, efficient way his economic function. The industry, as a whole, has a right to have its component and essential units prosperous and successful from legitimate profits for honest service and work well done. The destructive force of "Lowered and Lowering Market" sweeps all these hopes aside, and when the tornado passes, if it ever really runs its course, leaves nothing worth while in its wake.

It is not the below-cost price on this

odd \$50.00, \$100.00, \$500.00, or \$1,000.00 job that matters, although these are sure and unfailing causes—little beginnings—leaks in the dam that lead on to the later contagion and destruction. What does matter is the effect on \$100,000.00, \$250,000.00, \$500,000.00, \$1,000,000.00, \$50,000,000.00 or \$200,000,000.00 worth of work, if these are the figures for the work in your territory in a month, a year, two or five years or indefinitely. Just compute mentally on any of this volume a decent profit which you do not get, and then if you can stand the shock, similarly figure the loss to your industry, resulting from lowered market; you do, however, share in the loss—it is a group industry loss but once assessed, it must be prorated to each and every one of you. Compute your deserved profit indefinitely and compute your actual loss indefinitely. Are we talking about anything? Outside of terms of dollars, it is the difference between happiness and sorrow, prosperity and failure, reasonable and decent profit and unreasonable and unjustified loss, with all that might go with profit, success and prosperity, and all that certainly goes with loss, adversity and failure.

*Again the Contractor-Dealer. What He Must Do to Put and Maintain His House in Order:*

- (1) Accounting system, indispensable and complete, suitable to the needs of the business, regardless of size.
- (2) Cost accounting in particular.
- (3) Knowledge of overhead and absolute inclusion of it in costs.
- (4) Percentage of net profit desired.
- (5) Prime cost.
- (6) Percentage of mark-up to add to cost of labor and material.

(7) Proper selling price.

(8) The Electragist plan of computation.

(9) Regard the jobber as friend, physician, and counsellor, but own your own soul and be not dictated to by or slavishly dependent upon any man.

*Again the Jobber. What He Must Do in Meeting the Approach of the Contractor-Dealer:*

(1) Here we have the indictment of Clyde Chamblin, president of the Electragists, International, in his paper presented to the jobbers at Del Monte last October. I quote without any comment: "And then, the blessing, or curse of credit. I have sat in numberless meetings with jobbers, and never have I heard one of them admit, but on the other hand absolutely deny, that he ever extended credit without the most careful investigation. All are absolutely pure. In the face of this, gentlemen, look at the record, which is more eloquent than words. Are you kidding yourselves, or trying to kid us? If so, let me tell you that you are kidding nobody but yourselves. The old hackneyed expression, 'If we don't extend credit, the other fellow will,' is as unsound as for a contractor to say, 'I had to take the job at cost because the Whosis Electric Company were on the job.' When manufacturers and jobbers are using the same identical tactics as the contractors to get business, who are they that they should tell the contractor how to run a successful business?"

(2) Permit only temporary loans as against capital or permanent ones, just as any good banker does.

(3) Have definite terms of sale—strictly enforced.

(4) Refrain from jobber competition with contractor-dealer, in all its phases

\*A paper presented at the Convention of the California Electragists, Southern Division, March 17, 1928, at Santa Barbara, Calif.



### The Contractor-Dealer

These accusations are brought against him:

1—He has no accounting system or very often one that is perhaps worse than none at all. How can he tell where he is going, chart his course, or arrive at the right destination unless he has this proper compass of any business?

2—He has consequently no proper idea of costs, and with costs unknown, how can he determine proper selling prices?

3—He is guilty of "Guesstimating," or worse, instead of estimating; guessing may have some proper place of its own, but not in business.

4—He spreads and helps to spread, at least by placing causes and ignoring business precautions, the contagion of unfair competition. An isolated case is bad enough at best, but can you properly visualize the effects of contagion, multiplied and pyramided without end?

5—He himself lowers, and what is worse, effectually contributes to the lowering of market for the entire industry. Keep this thought particularly in mind. It deserves and will receive more attention later.

6—He goes down eventually, generally sooner but always later in final failure, but unlike the ordinary individual death, his bad effects live on and on, continuing their destructive work long after he has gone.

—principally in credit. Any other policy is unfair. No jobber can fairly compete with his customer.

(5) Reflect now and then on the idea—"Jobber-Banker." Let me quote from J. L. Kline's October, 1927, Del Monte paper on this same subject: "There is no more reason why the electrical supply jobber should exchange credit with an electrical contractor-dealer without having certified evidence of the contractor-dealer's ability to use properly and not abuse that confidence, than there would be for a banker to loan money without proper security. There is no difference in lending money and lending material—except in name."

(6) Have a high, fair, honest policy, rigidly enforced in all departments of the business, and in this particular instance—a credit policy.

#### Penalty for Failure So to Do. The Contractor-Dealer:

(a) All suffer—the conscientious, fair and legitimate along with the guilty.

(b) The industry suffers through high business mortality and turnover through lowered market and general

lack of public confidence in the contractor-dealer and in the profession he represents.

(c) Final failure with loss to himself of whatever he had in his business, with loss to his sources of supply, with almost irreparable consequent damage to the industry, and with the disgraceful heritage of a poison he created or helped to create to carry on and on after he himself has failed and gone.

#### The Jobber:

(a) Financial loss and generally out of all proportion to normal, expected losses, which should never injure either the jobber, the contractor-dealer, or the industry. No business, sound in its present and building soundly for its future, can legitimately stand abnormal and excessive losses.

(b) A reputation for unfairness and lack of true sportsmanship in not treating all his trade fairly and alike. Conscience should really be a more potent force than reputation.

(c) Contributor to lowered market from which both himself and the remaining contractor-dealers, as well as the industry, suffers. Aids, by placing or tolerating causes, ultimate failure, and thus, by failing to discharge the obligation of "brother's keeper," very often is guilty of commercial homicide. Helps in spreading contagion to the entire contracting industry.

(d) Proves himself a poor business man, lacking in both selfish and mutual, ordinary good business judgment. No right-minded business man courts such an accusation.

#### The Solution of the Problem:

An old truth is here borne in upon us: How strange it is that very often when you stand too close or very close, you cannot get the proper perspective. That seems to have happened to all of us here. Only two things are necessary, but these are simultaneous, certain and indispensable. Harry H. Walker in his paper last year proposes both:

(a) For the contractor-dealer, *Correct Cost Accounting*.

(b) For the jobber, *A Definite Credit Policy, Definitely Enforced*. If you and we do both of these things respectively and at the same time, all other things that we desire and need shall come unto us, our problem will be solved. We must get at fundamentals; we cannot build soundly and wisely except upon a real and right foundation.

This to my mind is the fundamental

### The Jobber

These accusations are laid at his door:

1—Granted broader experience, more complete organization, adequate accounting system, proper knowledge of costs, etc.—with all this wonderful equipment, does he function always in justice to himself, the contractor-dealer, and the industry?

2—He is one whom the influence of unfair competition, if it ever occurs, should not affect, in view of the equipment and qualifications that should go with the term "jobber"—but does unfair competition at times still break down his resolves, and leave him open to abuses only waiting to creep in?

3—He possesses, or should possess, good business judgment, which tells him what to do and what to avoid, but in spite of his real conviction, does he always, and come what may, exercise good judgment—the best asset of any business man?

4—The jobber who fails to do these things and do them all the time, just as the contractor-dealer on the side, only too effectively contributes his destructive efforts to lowered market with its disastrous results.

solution, but presented in its briefest form. If you will bear just a little more, permit me to amplify with some necessary details:

#### (a) What the Contractor Must Do:

(1) Have character, capacity and capital on entering business and continuing in it.

(2) Complete and adequate accounting system, suited to size and needs of the business—to show all the time where the business stands and what is its trend.

(3) Special emphasis on cost accounting with reference to overhead, percentage net profit, prime cost, percentage mark-up, selling price.

(4) Get a fair price and profit for quality work, be a fair competitor, a constructive, not destructive, force in the industry.

(5) When entering business, prove worthy of credit, maintain himself so, and always be able to show basis for credit desired or needed.

(6) Establishment and continuous maintenance of correct cost accounting.

(7) Such a contractor will succeed and prosper if competitors cannot secure unfairly from the jobber permanent or capital financing—excessive and unjustified credit.

#### (b) What the Jobber Must Do:

(1) Grant credit only to those who

can show themselves worthy—entitled to it—who can qualify under the conditions just outlined for the contractor. Credit or its refusal would be a sound conclusion based on facts—not in any sense an agreement, arrangement or plan dependent on these conditions.

(2) Refrain from permanent financing and excessive, unjustified credit.

(3) Never be competitor of contractor, but rather friend, counsellor and partner as members of same industry.

(4) Let the self-condemned failures, the hopelessly incompetent, the unfair, the unscrupulous, the commercial crook, the fraud and the pirate—those who will not put and keep their house in order—pass along to sources, who do not shrink from the stigma of "Unfair Competitors of the Contractor-Dealer," to take

sooner or later but inevitably the loss and pay the penalty for their folly.

(5) Have a policy, both general and in all departments of the business—scrupulously adhere to that policy—be known as a house with a policy.

(6) Specifically, sell merchandise on definite terms to those entitled to buy and worthy of credit, within justified limits, both as to amount and time—collect accounts when due. At the same time grant necessary temporary extension when justified but under a positive and definite arrangement.

(7) The jobber must have back-bone instead of merely wish-bone—hew always and unrelentingly to sound business standards in general—to sound credit standards in particular—"let the chips fall where they may."

## \$6,000 for \$20

A Unique Idea That Produced a Lot of Business at Low Cost  
By Fice Mork

**J. WAGNER**, manager of the Imperial J. Sewing Machine and Electric Co., New York City, has discovered a direct mail idea that gets attention and produces immediate and satisfactory returns. The letter is in the form of a legal court summons and the recipient naturally reads it at once because he believes it to be a summons.

Care was taken to make the copy humorous enough so that no one would

get angry after he read it, and Mr. Wagner found on actual test that only four people telephoned him and demanded to know why bills had not been sent before the summons was served.

The results were extraordinary. A total of four hundred letters was sent to a picked list of cloak and suit manufacturers who had electric motors and sewing machines. None of the four hundred had ever done business with

the Imperial Company. Out of the list, fifteen actual orders were received.

According to Mr. Wagner: "The whole job cost me \$20.00, including printing and postage. I have done business with fifteen new people as a result of the letters. I got some very nice jobs, including wiring and lighting contracts, motor repair jobs, lamp sales and the complete electrical work of three new factories. The business produced totaled six thousand dollars net. Not bad, eh?"

Mr. Wagner expects to follow up the summons letter with a "contempt of court" letter, to all the prospects who failed to answer the original summons.

## Analysis of Code

(Continued from Page 31)

ing the demand factor of 70 per cent to the larger sizes, 70 per cent of 141 per cent is approximately 100 per cent.

Electrically Heated Cooking and Baking Appliances.

The sizes of feeders supplying electrically heated cooking and baking appliances, each rated at more than 1650 watts, may be determined on the basis of the demand values shown in the following table:

Number Ranges.	Demand Factor.	Number Ranges.	Demand Factor.
1	100%	14	42%
2	100	15	40
3	95	16	39
4	90	17	38
5	85	18	37
6	80	19	36
7	75	20	35
8	65	21	34
9	55	22	33
10	52	23	32
11	48	24	31
12	46	25	30
13	44	Over 25	30

**Power Loads.** In Rule 808-k it is stated that the authority enforcing these regulations may permit a demand factor to be applied in determining the size of wire to supply two or more motors, but no method is given for computing this demand factor.

**Section 614, Use of Flexible Cords.**

In Rule 614-e, corresponding to old 612-g, it is required that:

Flexible cords shall be so connected to all fittings that the strain will be taken from the joints and terminal screws by a knot in the cord, winding with tape, a special fitting for the purpose, or other suitable means.

The two following rules are new:

h. Flexible cords not smaller than No. 18 gauge, and flexible cord of smaller sizes approved for use with specific devices, may be attached to circuits fused at not over 15 amperes for not exceeding 150 volts and not over 10 amperes for not exceeding 300 volts, and shall be considered as protected by such circuit fuses.

Flexible cords of No. 18 gauge or larger if required, may be approved for use with specific devices on the medium duty appliance branch circuits described in Section 1602 and which are fused at not over 25 amp.

i. No wire smaller than No. 18 shall be used for fixture work or flexible cords, except as approved for specific devices.

The old Section 611, General Requirements for Use of Conductors, is omitted, the essential features of this section being now incorporated in Article 5. The old Section 613, Special Requirements For Use of Conductors in Central and Sub-Stations, etc., is omitted.

(Continued Next Month)

Telephones Lackawanna 0564  
7567

INDEX No. 1265

YEAR 1928

New York Public Court New York County

Borough of Manhattan

District 5th

**Imperial Sewing Machine & Electric Co.**  
254 West 35th Street N. Y. C.

Plaintiff

against

Joseph Smith  
1375 Broadway

Defendant

### SUMMONS.

**You are hereby Summoned** to answer the notice in this action: FIRST, For several years your account did not seem to appear on our books; SECOND, Your requisitions for Sewing Machines, Electrical Motors and equipments are not received by our office; THIRD, That orders for Sewing Machines, Electrical Installations, the Wiring for Light and Power for your Plant, are not reaching us; FOURTH, That you do not owe us ONE penny. THIS IS NOT SATISFACTORY.

You are requested to kindly write or telephone Lackawanna 0564, Lackawanna 7567 for your immediate Sewing Machines, Electrical requirements, prices, deliveries, etc., can't you arrange to owe us something NOW?

Dated April 7, 1928

SATISFACTORY WORK.

Witness:

*Julius Bayer*

*Imperial Sewing Machine & Electric Co.*



# Estimating Methods---XII

## Motor Control Apparatus Compensators Rheostats

## Magnetic Switches Power Labor Costs Special Records

By ARTHUR L. ABBOTT

Technical Director, Association of Electragists, International

CONTINUING the subject of the installation of motor control apparatus, the item next in order is hand operated starting compensators for two-phase and three-phase motors. The labor data in Table 18 is based on the use of the type of compensator which is entirely self-contained, i. e., requiring no separately mounted cut-outs or relays, and having a separate connection box which can be mounted first and to which the conduit can be run and the wire pulled in. After these operations, the compensator is set in place and the connections are made. Additional labor will be required for types of compensators which are not so well designed for easy installation.

The National Code requires a switch to be installed ahead of a compensator to serve as a disconnecting switch. Labor on this operation is not included in Table 18, but should be figured in addition, taking the time from Table 16 for externally operated switches.

TABLE 18—A. C. MOTORS—Mounting and Connecting Starting Compensators for 3-Phase Squirrel Cage Induction Motors. For 2-Phase Motors, 4-wire, add 15 per cent.

Total time for mounting compensator, making connections at compensator and motor, and testing motor for direction of rotation. No labor is included for installing conduit or pulling in wire.

Voltage	Motor H. P.	Time in Hours—Mounted On		
		Wood	Brick	Concrete
220	7½-10	5.0	5.5	6.0
	15	6.4	7.0	7.5
	20-25	7.2	7.8	8.3
	30	8.0	8.5	9.0
	40	9.0	9.5	10.0
	50	9.5	10.0	10.5
	75	10.0	11.0	11.5
	100	13.0	14.0	14.5
	7½-10-15	5.0	5.5	6.0
	20-25	6.0	7.0	7.5
440	30	7.0	7.5	8.0
	40-50	7.5	8.0	8.5
	75	9.0	9.5	10.0
	100	10.0	10.5	11.0

For compensators used with two-phase motors wired four-wire, to cover the additional connections required, 15 per cent should be added to the labor given in the table for three-phase motors.

A test of the time required to mount a compensator on a round concrete column showed that approximately the same labor was required as is allowed in Table 18 for mounting on wood. The compensator was supported on the column by a special steel mounting consisting of six pieces. Two rods threaded at each end passed around the column and through holes drilled through two vertical pieces of 1 1-4 inch pipe about 22 inches long. Each piece of pipe was threaded and provided at each end with two heavy locknuts such as are used by steamfitters. Two pieces of No. 10 steel, about 5 1-2 inches wide by 15 inches long, were sheared and ground to roughly fit edgewise against the column and each was punched with two holes to take the 1 1-4 inch pipe. A 1 1-2 inch flange was turned up on the edge of each steel plate away from the column and these flanges were drilled with holes for the compensator mounting bolts. The pieces of pipe were secured to the steel plates by the locknuts, making a rigid rectangular frame, and this was securely clamped to the column by means of the two steel rods. This mounting rig was made up in a shop

TABLE 19—A. C. MOTORS—Mounting and connecting Dial Type Speed Regulating Rheostats for 220 Volt 3-Phase Slip-Ring Induction Motors, Including Externally Operated Switch and Making Connections at Motor.

Motor H. P.	Time in Hours—Switch and Rheostat Mounted On		
	Wood	Brick	Concrete
1	3.8	4.4	5.4
2-3	4.2	5.0	6.0
5	4.8	5.6	6.7
7½-10	6.3	7.2	8.3
15	7.4	8.4	9.4

and the time record mentioned above did not include the shop work. Additional time must be allowed for making up any similar outfit on the job.

Table 19 applies to the dial type controller or speed regulator for small slip-ring motors, the rheostat being a self-contained device having resistance, contacts and swinging contact arms in one enclosing box. The labor for installing an externally operated switch has been included in each case, because the motor connections cannot be made without this switch or a similar device. The mounting time for the rheostat is based on weights given in one manufacturer's catalog and the wire sizes for the secondary motor leads had to be assumed, therefore this data is only approximate, but it should be convenient as a general guide.

For control of the larger sizes of slip-

TABLE 20—D. C. MOTORS—Mounting and Connecting Starting Rheostats and Externally Operated Switches, including all connections at switch, rheostats and motor.

For speed regulator with shunt field weakening instead of plain starting rheostats, add .5 hour in each case.

Voltage	Motor H. P.	Time in Hours—Switch and Rheostat Mounted on		
		Wood	Brick	Concrete
115	½-¾-1	4.0	4.6	5.6
	1½-2-3	4.5	5.0	6.0
	5	6.0	6.7	7.7
	7½	8.0	8.7	9.7
	10	8.5	9.2	10.3
	15	10.0	10.7	11.8
	20	10.8	11.7	12.7
	25	13.3	14.3	15.4
	½-¾-1	4.0	4.6	5.6
	1½ to 5 inclusive	4.5	5.0	6
230	7½	6.0	6.7	7.7
	10	6.6	7.4	8.5
	15	7.9	8.7	9.8
	20	8.6	9.4	10.5
	25	9.9	10.7	11.8
	30-35	10.7	11.6	12.6
	40	11.3	12.2	13.2
	50	12.8	13.8	15.0

ring motors the installer usually has to contend with at least three separate devices: A main switch or circuit breaker, a drum controller, and a grid resistor. There is so much variation in types and weights of this apparatus, also in the number of connections to be made and methods of mounting that it is hardly possible to compile any labor data for general use. With given data, including weight of each device, wire sizes, number of connections between drum and resistors, and method of mounting, the total labor may be approximated by using Tables 13 and 14, always adding a fair time allowance for testing out the complete assembly and making minor changes.

Table 20 applies to the simple case of a hand operated D. C. motor-starting rheostat combined with an ordinary externally operated switch. This data is based upon rheostat weights as given in one manufacturer's catalog and assumed sizes of wires and switches. Possible variations in these sizes would change the figures somewhat, but probably not enough to be of much importance. It is also assumed that the

TABLE 21—D. C. MOTORS—Mounting and Connecting Speed Regulating Rheostats (control by resistance in armature circuit) and Externally Operated Switches. Including all connections at switch, rheostat and motor.

Voltage	Motor H. P.	Time in Hours—Switch and Rheostat Mounted on		
		Wood	Brick	Concrete
115	1/2-3/4-1	4.7	5.3	6.4
	1 1/2-2-3	5.2	6.0	7.0
	5	7.0	8.0	9.0
	7 1/2-10	9.0	10.0	11.0
230	1/2-3/4-1	4.7	5.3	6.4
	1 1/2-2-3	5.2	6.0	7.0
	5	5.5	6.4	7.4
	7 1/2-10	7.2	8.0	9.0

switch and rheostat will each be mounted separately. In some cases the two devices will both be mounted on one steel supporting rack. With this construction the total time should be about the same as given in the table for mounting on wood, but if the steel rack is to be made up on the job an extra time allowance must be made for this item.

A starting rheostat for a D. C. motor, combined with a shunt field resistance for speed control, is a little larger and heavier than a plain starter. For starters and regulators of this type one-half hour should be added to each of the figures in Table 20.

Speed regulation of D. C. motors by inserting resistance in the armature circuit is a wasteful practice, as is well known, but it may occasionally be necessary to estimate the installation of this type of equipment. Table 21 covers hand operated rheostats of this type for motors up to 10 h. p., the labor for installing the main switch being included here, the same as in Table 20.

A. C. magnetic switches are not strictly motor control apparatus but are more likely to be used in connection with power wiring than elsewhere.

One common type of these switches is designed for use as an across-the-line starter for small squirrel cage motors and is provided with overload protection, either thermal cutouts or a thermal relay. Table 22 gives the installation labor for 30 amp. 3-pole and 4-pole switches of this type. These switches being strictly motor starting switches, the data in this table includes a time allowance for making connections at the motor. Time is also included for the mounting and connection of a push-button control station, but not for the installation of any conduit or wire between the switch and control point. The conduit will usually be run exposed and if so should be figured according to the data in Table 7, Class E 1, E 2, E 3, E 4 or E 5. The control wires will be two or three No. 14, on which the labor will be as stated in Table 8.

A. C. magnetic switches, consisting

TABLE 22—Mounting and Connecting 30 amp. A. C. Magnetic Switches with thermal cut-outs or relays used as starters for small squirrel-cage motors. Time is included for mounting and connecting push button control station, also for making connections at the motor and testing. No time is included for installing conduit or pulling in wire.

No. of Poles	Time in Hours—Mounted On		
	Wood	Brick	Concrete
3	4.7	5.0	5.8
4	5.4	5.8	6.6

TABLE 23—Mounting and Connecting 3-Pole 220 Volt A. C. Magnetic Switches. Time is included for mounting and connecting push button control station. No time is included for connection at any other apparatus controlled by the switch, for installing conduit or for pulling in wire.

Capacity of Switch Amperes	Time in Hours—Mounted On		
	Wood	Brick	Concrete
15	3.6	4.0	4.8
75	5.5	6.3	7.0
150	7.0	8.0	8.6
300	9.3	10.0	10.8

of a plain magnet-operated contactor without any overload protective device are made in several sizes. A small switch of this type may be used as an across-the-line motor starter but having no overload protection is not as suitable for this purpose as the previously mentioned type. Table 22 applies to this type of switch. In this case no time allowance is included for making the connections at the apparatus or device which is controlled by the switch, nor for any conduit or wire-pulling labor. The control station being a necessary part of the installation, the mounting and connecting of this device is included in each case.

Table 24 applies to a simple form of push button operated starter for D. C. motors, such as the General Electric Co. C. R. 4022-J1. This is a non-reversing type without speed regulation. A line switch and push button control station being essential parts of the equipment, labor for installing and connecting these is included, also for making connections at the motor.

For the contracting organization,

TABLE 24—D. C. MOTORS—Mounting and Connecting Push Button Controlled Magnetic Switches and Line Switches. Time is included for mounting and connecting push button control station and making connections at motor. No time is included for installing conduit or pulling in wire.

Voltage	Motor H. P.	Time in Hours—Starter and Switch Mounted On		
		Wood	Brick	Concrete
115	1-2-3	7.0	8.0	9.0
	5	8.4	9.4	10.7
	7 1/2-10	10.0	11.0	12.5
230	1-2-3-5	7.0	8.0	9.0
	7 1/2-10	8.4	9.4	10.7
	15	9.7	10.7	12.0

which is capable of rendering a real service in power wiring, this field offers an attractive opportunity to build up business of a class where the competition is not altogether a matter of price. A good knowledge of costs is a decided advantage in efforts to secure new business and is essential to rendering the best service.

It will pay to keep certain records of labor costs on nearly all power jobs. A firm which specializes on power installations in printing establishments finds that for each of the more common type of press equipment the distances between controller and motor and between controller and control stations are nearly always close to average fig-



Any record of any kind on power work should, of course, include an outline description of the installation, stating size and type of motor, type of controller, and other important details.

local newspaper advertising. This year the plan called for a series of six advertisements, stressing the convenience of duplex outlets, and suggesting that customers who wanted convenience use of

One of the problems an electrical contractor faces when he tries to sell new motors to industrial plants is the competition. Not only do the various motor dealers cut their profits to the vanishing point in order to bid low enough to sell, but manufacturers often give discounts to users which are as great as those they give to their own dealers. There are dealers, however, who are able to sell new motors successfully. A. C. Huntley, of the Huntley Electric Company, Brooklyn, N. Y., is one of them. In this article he tells how he does it.—The Editor.

## How to Sell Motors in Competition

By A. C. HUNTLEY  
President, Huntley Electric Company

**T**HE chief trouble with the motor business today is the competition.

When an industrial plant's purchasing agent decides to buy a new motor he generally sends requests for bids to every sort of dealer and manufacturer. If the job is a big one, the manufacturers submit bids direct, usually giving to the purchasing agent all the discounts they give to dealers. Often the manufacturer who has an exclusive dealer in a certain territory will bid against his own dealer for an order, sometimes, in the hope of getting the business away from other manufacturers, quoting a price even lower than he gives his own dealer.

### Discounts Given Away

When the manufacturers aren't bidding on a motor order there is the fiercest sort of competition among motor dealers. The usual discounts are 15 per cent and 5 per cent. Far too frequently the dealer will give away the 15 per cent to an industrial plant to land a motor order, and sometimes when competition is particularly severe, he gives part or all of the 5 per cent, too.

I consider that this 5 per cent is not a dealer's discount at all. This is a cash discount made for payment of the invoice within 30 days. It is merely a financial discount to which the dealer is entitled if he finances the purchase—as he sometimes is not paid himself within 30 days. To give away this cash discount is utterly absurd.

It is necessary, sometimes, to share the 15 per cent dealer discount with large purchasers of motors, and perfectly proper, too, since a quantity purchaser is always entitled to better prices



A. C. Huntley

The author of this article, A. C. Huntley, E. E., has been actively engaged in electrical work since 1897. He formed the Huntley Electric Company, Inc., in 1916, and a few months ago moved to a larger shop in Brooklyn, N. Y. His business includes testing and repairing motors and dynamos, electrical contracting, and installation of control apparatus and motors. Mr. Huntley is often called upon as consulting electrical engineer on important projects.

than a small purchaser. But to give the entire 15 per cent to the customer, even when he is a large buyer, is ruinous.

Usually there are ways of avoiding this competition. When I run into a job where dealers are giving away a 20 per cent discount, I take a vacation.

Sooner or later that sort of competition will eliminate itself because those dealers can't continue. When they are gone the business comes back to me again. A man needs a rest now and then, anyway, and if he charges fair and reasonable prices he can make enough money, even from the sale of new motors, to take a vacation when the situation gets too bad.

Under ordinary competitive conditions, such as when other dealers are giving discounts of 18 per cent, I find it possible often, by talking to the purchasing agent, to get the sale at my own price. In those cases my argument is this:

### Sales Argument

"Mr. Purchasing Agent, I will lay my cards frankly on the table. If the motor you are offered for an 18 per cent discount is a standard make, suitable for your purposes, it is just as good as the motor I am offering you. You will save money by taking the other offer. But you have to take certain things into consideration beside the saving of a few pennies.

"A motor dealer is entitled to a fair profit. Unless you give us a fair profit, we can no longer do business, and sooner or later this will result in chaos. Then when you go looking for a motor man for consultation or for repairs, or for a new motor, you will find there aren't any! The manufacturer gives me a 15 per cent discount on new motors. In addition, I am entitled to a 5 per cent cash discount if I pay the invoice within 30 days. The latter is simply a discount for financing the transaction. My money is tied up and I am entitled to



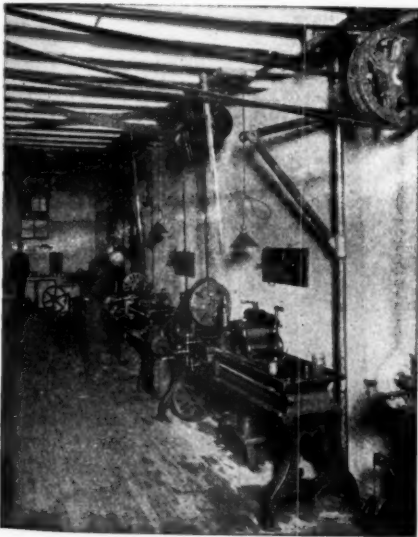
payment for the use of my money.

"From the 15 per cent dealer discount must come my overhead charge, and my profit. If I receive a fair price for the sale, I pay for my shop, I stabilize my bank account, I am able to live.

"Supposing you buy from the other dealer. He makes no profit and pays only a very small part of his overhead. At that rate he will be able to continue in business about a month. Now, if something happens to your motor two months later, what can you do? The dealer is no longer in business. He is a mechanic for someone else, or he may be in another part of the country.

#### Responsible

"On the other hand, I am a responsible business man. I have been in business for years; if a motor I sell you goes wrong, you know right where to find me. I will have to give you good service or you will broadcast my deficiencies and no one else will do business with me. I have a bank account which you can attack; you can sue me if I don't live up to my agreements. But



The Second Floor Houses a Modernly Equipped and Efficient Machine Shop

I can't continue in business unless you let me make a fair profit."

After presenting my story in a form something like that, the sale is often awarded to me, at my own price. Even purchasing agents realize that a man is entitled to a reward for his services, and the argument about stability being dependent upon a reasonable price is one difficult for him to resist.

Of course, there are many purchasing agents who buy entirely on price. They play dealers against each other, some-

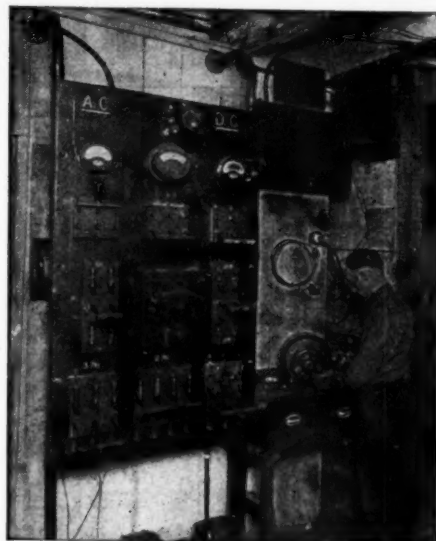


The Shop of the Huntley Electric Company, with Mr. Huntley and part of His Office Force

times lying about the price quoted by one dealer in order to get another dealer to cut lower. With those people I can not hope to do anything. But most good concerns are reasonable.

Another protection a dealer has against competition, particularly against the manufacturers, is his jobber. I much prefer to be on good terms with my jobber than to have the exclusive agency for a motor direct from a manufacturer.

Often when a big job is in prospect the manufacturer will bid against his own dealers, but if I buy through my jobber, he will fight the manufacturer for me. A large manufacturer doesn't worry when a small dealer argues with him, but he listens with respect when a wholesaler speaks.



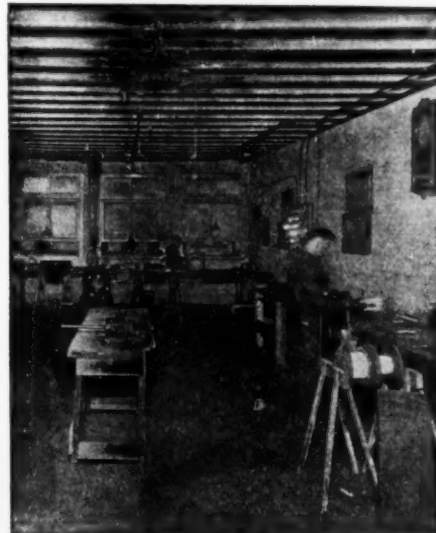
A 2200 Volt A.C. and D.C. Testing Switchboard is part of the Huntley Shop

The jobber is just as anxious for me to make a big sale of motors as I am, for it means a profit to him. So if the manufacturer begins smelling around and it appears that he may bid on the job, too, the jobber immediately goes into battle. The prospect not only of losing all the business of this jobber, but also of having him actively pushing the goods of competitive manufacturers, and passing the story about, is too much for the manufacturer.

But the best method I have for eliminating competition and price cutting is to prevent bidding entirely.

#### Reputation

Many of my customers have been with me for years. When they build a new factory or move to another building, they call upon me to do the entire electrical job. As a consulting engineer I advise them on their electrical layout. As a contractor I install all the wiring and lighting equipment. And naturally when it comes time to put in motors I install those, too. The industrial concern knows me and knows that



The Winding Department, Located on the Second Floor, is Where Armatures are Sent for a Thorough Overhauling

I will charge only a fair and reasonable price. In one recent job they didn't even ask for an estimate. The whole job, amounting to \$14,000, was done on a time and material basis—lighting and power equipment, wiring, and motors, and they paid no attention to prices, knowing they would be right.

When the industrial is sold on the motor dealer and his methods he has no trouble selling motors against competition—because there is no competition.



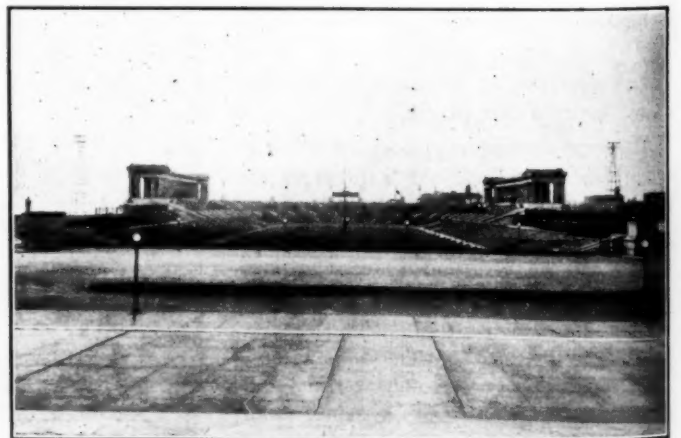
Above: Looking north on LaSalle Street, one of the main business arteries

Below: Field Museum, in Grant Park, containing many interesting exhibits from the old museum building of the World's Fair in 1893



Left: Lake Shore Drive and the bathing beach in Lake Michigan at Oak Street

Below: Soldiers' Field, where the Tunney-Dempsey fight, the Army and Navy football game, and the Eucharistic Congress were held



# All Roads CHICAGO

Electragists Will  
Aug. 6-10 for 28  
Comm



# Lead To CHICAGO

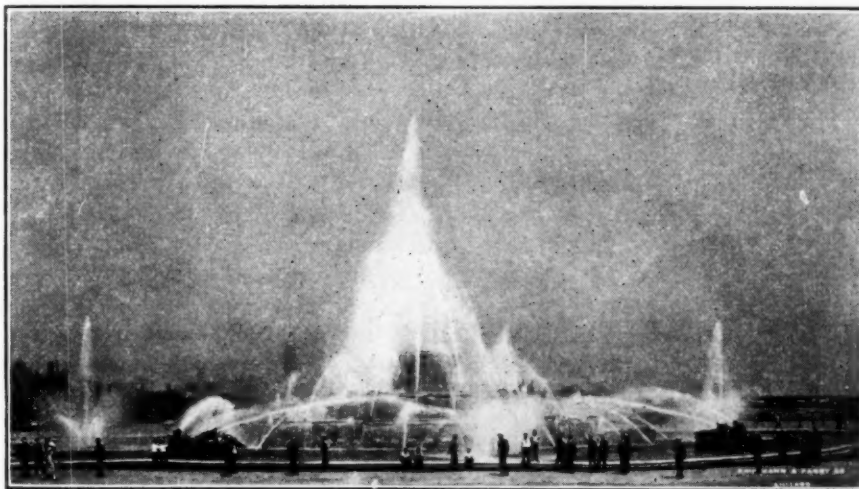
Will Meet in Chicago  
for 28th Annual  
Convention



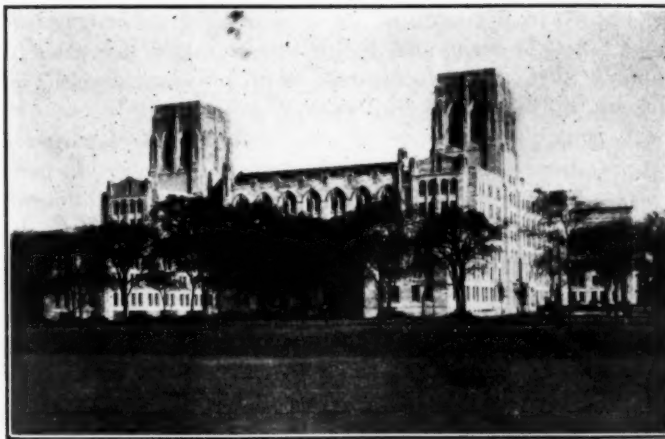
Above: Night in Chicago. View of Wacker Drive from the Wrigley Annex

Right: Buckingham Fountain, illuminated with colored lights, which will be playing during the convention period

Below: The Art Institute on Michigan Ave., containing interesting exhibits of paintings, sculpture and antiques



Below: One of the beautiful buildings on the campus of the University of Chicago



# Chats on the National Electrical Code

*A Monthly Discussion of Wiring Practice and Questions of Interpretation,  
Presented with a View Toward Encouraging a Better Understanding of the In-  
dustry's Most Important Set of Rules*

Conducted by F. N. M. SQUIRES  
Assistant Chief Inspector, N. Y. Board of Fire Underwriters

## 1928 Code Approved by Electrical Committee

Well, we are to have a new 1928 Code at last. This has been approved and now it is simply a wait for the printing and distribution and then for inspection authorities to put its provisions into effect. This Code is the result of several persons' efforts for quite a few years and is made up of unchanged previous rules, reworded provisions with meanings unchanged and entirely new materials and ideas.

The unchanged rules are old stand-bys which need no revision and which will probably stand for some time to come. The old rules in new dress are previous ones which have had their grammatical structures repaired for the sake of clarity so that their intent may be more clearly understood. Let us hope that some former controversies may be therefore eliminated.

But the new parts are in many instances entirely new to Code rulings, though the ideas in back of them have been creeping through for some time. Some of these are to cover the use of new material, such as thin wall metallic tubing, but others will give the users of the Code something to think about, such as circuit layout, adequate circuits and feeder requirements. We will from time to time comment on these matters in these columns.

There are a couple of items which might well be mentioned at this time in order that manufacturers, supply houses and contractors will not be left with unapproved material on their hands when the rules become effective.

The first of these is in reference to combination features. While the use of these has greatly diminished of late years, a considerable number are still being installed. But rule 1403-c (last sentence, 1928 Code) reads, "Combination gas and electric fixtures shall not be installed". Thus a very serious fire hazard will be eliminated, one from

which considerable damage has already resulted when a splice or wire at a combination fixture shorts on to the gas pipe, burning a hole in the pipe and setting fire to the escaping gas.

The other prohibition which must be considered occurs in Rule 703-b (1928 Code) which reads, "Outlet boxes for concealed work shall have an internal depth of at least 1½ in., except that where the installation of such a box will result in injury to the building structure, a box of not less than ½ in. internal depth may be installed."

It might well be mentioned that the last part of the above quoted rule will not be construed as a loophole for the continued use of shallow boxes. This means that stocks of stud and shallow boxes must be depleted as rapidly as possible and not replenished to last beyond the time of the 1928 Code becoming effective.

As we have said before, "A word to the wise should be sufficient."

## Blower Motors for Organs

Judging from conditions encountered recently in connection with organ blowers a great deal more care should be exercised in their installation.

Inspections revealed that these motors were installed in wooden boxes, sometimes connected with the organ and at other times sunk in the floors nearby and the wood chips and shavings not cleared out. To make matters worse, these boxes were made practically air tight with the idea, evidently, of making them sound proof. This, of course, allowed of no ventilation, very seriously endangering the life of the motor. Moreover, being so thoroughly closed up, the motors were apt to suffer from insufficient attention and thereby were apt to be left improperly oiled for considerable lengths of time.

In installations of this kind we must consider that pipe organs are chiefly

used in places of public assemblage, such as churches, auditoriums, etc., where a considerable number of women and children are likely to be present. For that reason alone every precaution against all hazards should be taken.

Then the motor should be readily accessible for oiling and cleaning. Ventilation, of course, is essential and if it is boxed the enclosure should be made fireproof. The housekeeping of the installation should be attended to but if it starts off with an accumulation of shavings, how can it be expected that conditions will improve with age?

## Wireways, Etc.

A trough or gutter, such as used at the top or in the back of switchboards, is classed as a wireway. This type of wireway in the past has contained all of the conductors large and small, used to supply the entire electrical equipment with current. If this wireway is not subdivided into compartments by suitable barriers, the entire group of conductors may be destroyed by a single insulation failure.

Rules for the Code have been proposed that will limit nine wires or less to any one wireway or section of a wireway. We are not certain that such a rule will be acceptable to the Electrical Committee, but we are strongly in favor of it. Contractors are requested to subdivide or install the wireways even though we may not be able to report the mass of wires as a National Electrical Code violation.

Wireways are not always used back of switchboards. They may extend for a considerable distance. We have seen them used between the generators and the board for raceways, and as exceptionally large "junction boxes". In fact, any large enclosure for a number of wires may be termed a "wireway", and barriers between wires may prevent excessive damage and loss of time when



a burn out occurs. Barriers of incombustible insulating material, such as approved asbestos board, are to be preferred to metal barriers. They are better heat insulators than metal, and are not as readily destroyed by electric arcs. In some cases, separate wireways for only a few wires may be used to advantage.

Wireways are usually made of metal, and if we depend upon locknuts and bushings for conductivity (grounding), a metal wireway is necessary. If we use approved grounding bushings or clamps with jumpers between conduits, then the wireway may be made of  $\frac{1}{2}$  in. or  $\frac{3}{8}$  in. approved incombustible material, such as asbestos board held together at the edges with metal angles.

Where the wires leave the wireways back of the switchboard, they should be separately bushed. In some cases we have seen three wires of different polarity through one porcelain bushing in a metal wireway wall, or one hole in a wireway wall, when the latter is made of incombustible insulating material. Code standard requires wires to be separately bushed in fittings used on the ends of conduits, cabinets and boxes, and the rule should also hold good for wireways.

We would also caution contractors that we require rubber covered or wires with flammable insulation on the back of switchboards to be covered with asbestos tape, and care should be taken to stop the asbestos tape 1 in. or more before it reaches bare lugs or other bare parts. Asbestos absorbs moisture and is not a good insulator, neither is the cement used with the asbestos tape an insulator.

GEORGE WELMAN.

#### Just a Little About Rule 1002

Rule 1002—Covers generators, and paragraph (c) states that constant potential generators except exciters for alternating current machines shall be protected from excessive current by automatic cutouts of approved design, but the rule leaves the omission of the protection up to the inspection department. That is, when the generators are installed in central stations.

Inspectors find alternating current generators that are not protected by circuit breakers are fuses, in fact, some of the standard generator control panels for switchboards used with alternating current generators are not provided

with circuit breakers or fuses. The designers claim that they would rather not have the generator leads open in case of a short circuit, which would result in racing of the generator, engine or turbine, and that automatic protection of each circuit that leaves the switchboard is sufficient. This may or it may not be good practice for small plants at moderate voltages.

Flash overs are more apt to occur on extra-high voltage busses than on 2300 volt apparatus, and we think that extra-high tension generators should be protected against short circuits at the busses, and most of the extra-high tension equipment that we have seen is so protected. Many generators in stations operating at 2300 volts are not protected. We are, therefore, compelled to criticize unprotected generators as substandard. The engineers then get back at us and say: "How about a short circuit that might occur in the conductors between the generator and the switchboard, this might happen as well as a short circuit on the busses on the board." We are frank to admit that we are unable to solve this problem and are compelled to stick to the Code as it is written, which compels us to ask for a circuit-breaker or fuse of standard design on all generator circuits. Of course, we realize that this automatic protection does not protect the leads between the generator and the switchboard or the windings in the generator. The factory takes care of the latter by designing the generator so that it will be mechanically safe to operate at its rated speed and also by insulating the windings with the best possible insulation. In order to prevent short circuits in the conductors between the generator and the switchboard, there should be as short a distance as possible between the generators and the switchboard, and wherever moisture is present, lead sheathed cable or equally as good protection should be provided for the cables. Conduits underground that are not drained are considered as subject to moisture, regardless of the water level of the earth. A difference of temperature will cause condensation and in time fill an undrained conduit with water, or if it does not actually fill it with water, will create a damp, moldy interior that is about as bad as submersion.

There is another device which is desirable, but may not be a Code requirement, and that is a generator switch. Practically all generators have switches

on the board for each generator. This is absolutely necessary, even though the switch is not automatic, but now and then we find a single generator in some out of the way place where there is no switch provided. Probably a set of fuses is in the generator circuit and makes the outfit conform to rule 1202, but this does not satisfy us unless the switch is present. Of course, we all know that it is absolutely necessary to have a switch for each generator where more than one machine is connected to a common set of bus bars, but we are speaking of a single generator used in some branch road factory, or commercial building where some high line may or may not provide "stand by" current.

Here is what we should remember: Each constant potential generator should be protected from short circuits and overloads by a circuit breaker or fuse, except exciters for A. C. generators; the latter need not be protected. Also, unless an automatic switch (circuit breaker) is used, the generator conductors must have a switch to control the entire current of the generator. The latter may not be Code, but we will just figure that the Code is intended to require it.

GEORGE WELMAN.

#### Outside Services

The following appeared in the April, 1928 issue of "The Electrical Inspector", edited by Ben W. Clark for the Michigan Association of Electrical Inspectors and is passed along as a useful bit of information:

"During a discussion recently, the question arose of a proper manner of installing service on the outside of a rear wall of a building having a row of stores. In this class of structure the occupants frequently install additional devices which will overload the service.

"Again some of the stores may be divided, which would require another service from the outside. Considering these problems, the approved manner of such an installation would be to require the wires in the main run of service pipe to be of a size sufficient for the entire load of the building.

"The conduit containing these wires should enter an approved weather-proof box with provisions for additional conduit entrances, and the pipe for service tap to extend vertically from top of this box and have an approved service cap attached at the top."

# *The Electragist*

Official Journal of the  
Association of Electragists—International  
S. B. WILLIAMS  
Editor

## Why a Convention

Men come from the four corners of the country to attend conventions. Why?

The electrical contractors and dealers of the United States and Canada will journey to Chicago in August to attend the Electragist Convention. Why?

There are two reasons: The first has been emphasized so often. It is for the good the individual will get from contact with his fellows who have the same problems and who are trying in their way to meet them.

The second reason is not so well understood or appreciated, but is perhaps the more important of the two. It is for the purpose of being heard.

The Electragist Annual Convention is the voice of the electrical contractors and dealers of North America. During the year this branch of the electrical industry speaks through its national association, which is largely the expression of its officers. Once a year, at the annual convention, the membership speaks—that is the voice the rest of the industry is listening for. If this voice is loud in its protest against any practices on the part of others, it is heard respectfully.

The reaching power of the voice and its effectiveness are in direct proportion to its volume. A handful of men can't be heard very far.

If the contractors and dealers want merchandising practices on the part of central stations or any other unfair practices corrected, they must raise their voice. Chicago is the place to do it.

Come, join the chorus and make the voice of the contractors and dealers heard in every city in the land.

## Why Large License Fees

Every now and then we see an ordinance with a fee of a hundred dollars or more for a license. Why? Who gets the hundred dollars and what is done with it? What good does the fee accomplish and does it really do what it was expected to do?

Unfortunately, there are a large number of electrical contractors who still believe that restriction of number of competitors can be accomplished by legislation. How blind they are! A large license fee doesn't keep down numbers.

It is generally accepted that because of the character of work of an electrical contractor he should be licensed or registered. To license him a board must be set

up and an expense incurred. To defray this expense a fee is charged. So far, fine; but—when the fee is more than the expense, it is extortion.

A fee should be as large as is necessary to cover the expense of maintaining a licensing board or bureau and—no larger. Theoretically all that any city should be interested in is that contractors shall be qualified to install interior wiring in a safe and proper fashion. A large license fee is no indication of a contractor's ability.

## League Domination

One of the most valuable assets any city can have is an active electrical league. Leagues are no longer an experiment; they have proven their worth in so many places.

The primary function of a local league is to develop the local electrical market in a broad way. Naturally, therefore, the greatest and most lasting benefit is derived by the central station, which, it logically follows, should, and in most cases does, pay the larger part of the cost of the league operations.

The question, therefore, which constantly arises is this: Should the central station, by virtue of its assumption of the greater share of the expense, assume or be accorded the right of domination of league activities?

This is not a question that can be answered "Yes" or "No." There is much to be said on both sides.

Where the central station executives are broad-minded and far-seeing, their domination becomes progressive leadership. Leagues backed up by such utilities are making the greatest progress.

Where the central station men are narrow and can see in the league only an opportunity to pull some of their chestnuts out of the fire, the league will always be picayune.

Some utilities appear to be using their leagues to keep the contractors from becoming obstreperous. How silly! The league should be the place where the contractors can air their views and demand recognition of their rights. If conditions of the utility's making are not right, the utility ought to want to know as soon as possible.

Recently we heard of an electric league demonstrating and pushing gas appliances, presumably because the utility was a combination property. This, too, is short sighted.

League managers should be free from all dictation by the central station, or any other single group. They can receive almost unlimited help and guidance, where wanted,



from the lighting company, but in general it will be found that where no one interest dominates the policy or activities of the league there will be a greater spirit of confidence engendered and a greater possibility for an adequate contractor and dealer representation.

### Better Plans and Specifications

There are so many causes for unsatisfactory conditions on competitive work that it is difficult to point out any one thing as worse than another. Poor estimating, lack of knowledge regarding costs, lack of backbone, etc., have all been harped on. These are faults of the individual contractor. There is another cause for trouble, however, in this connection for which he is not altogether responsible but which he might easily help to correct. We refer to improperly drawn plans and specifications.

Many of the very largest buildings are today laid out by competent electrical engineers. Generally speaking, such plans and specifications are complete and permit the competitive bidders to estimate on equal basis.

A large volume of work, however, is done in the smaller buildings, which do not offer to engineers sufficient inducement to go out after that class of business. The result is that the plans received by the electrical contractor are either bare as regards the wiring and lighting, or are so muddled up and the specifications so garbled as to make it virtually impossible for the contractor to estimate until he has prepared his own plans and specifications. What is the result? No two bids are made upon the same work. The successful bidder, it will be found as a rule, offers a less adequate job. The customer, it is true, is going to have his electrical work done for a small number of dollars, but he is saving only at the cost of getting a poorer and less adequate job.

Electrical contractors would welcome some way in which competitive work could be offered to them with adequate drawings and specifications, so that all would be bidding on the same job. This might be done in various ways:

(1) The central station might be shown how it can furnish this service and by increasing the copper on the job provide a greater opportunity for future load. This is being done quite successfully now by one Pennsylvania utility.

(2) Local contractors' associations might find it very profitable to subsidize an engineer for the purpose of laying out competitive work. This engineer would work with the architects and owners. One local association has hired such a man and other associations are contemplating a similar activity. It is a piece of work which will save the electrical contractor many, many times the expense of the man.

The entire electrical industry is losing business today because of improperly drawn plans and specifications. Almost invariably such plans and specifications produce a smaller and less adequate job. They mean less work for the contractor, jobber and manufacturer and they serve to prevent the public utility from receiving the maximum revenue from the installation.

### The Best Code Ever

The Electrical Committee and everybody else who helped to make the 1928 National Electrical Code are to be congratulated. It is the best Code we ever had!

More time, harder and more intensive work were put into the 1928 Code than in any previous Code and the results are apparent.

The new Code is not perfect—no Code ever will be—but it comes nearer to meeting the advanced requirements of the field, is better correlated and easier to use than any previous Code.

The men who built the 1928 Code deserve the praise of the electrical industry.

### False Economy

In 1926 the loss from fires having an electrical origin amounted to more than \$13,000,000; in 1925 the loss was over \$15,000,000. These figures were compiled by the National Board of Fire Underwriters and to these totals it is customary to add 25 per cent to cover losses not reported.

A large part of this fire loss due to electricity, is caused by defective wiring that could have been corrected had there been a reinspection service provided. Is it not a false economy to save the cost of reinspection and permit this terrible waste from fire to continue?

### Wire Sizes

What is the difference in first cost between running No. 10 instead of No. 14 for branch circuits?

How much would the customer save the first year in current and light if he used the larger size wire?

Think it over. There's generally a pretty good reason for buying the best.

### Central Station Lamp Policy

Within the past few weeks we have noticed that a number of central stations have taken the trouble to explain their lamp renewal policy to their local dealers. This is encouraging, not that any of them have changed their policy, but because it showed a disposition on the part of those companies at least to try to build friendly trade relations.

It is apparent, of course, that those companies with a free renewal policy are so steeped in that policy that they are blinded to the error of their ways. They admit they are in the minority of central stations, but they just can't let go of a policy, in the beginning so necessary, and now grown to be almost a part of their operating creed.

Nevertheless, when power companies have progressed so far as to come forward of their own accord and discuss a policy so well grounded as free lamp renewals, it augurs well for improved trade relations and, in spite of statements now to the contrary, helps to break down resistance to a change in lamp policy.

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Master Elec. Contractors' Association			Portland (C) -----	J. R. Tomlinson	51 Union Ave., N.
Decatur (C) -----	F. J. Boyle	304 S. Halsted So.	Portland (C) -----	C. K. Mowrey	120 Grand Ave.
Granite City (C) -----	Earl Weatherford	114 East William St.	<b>PENNSYLVANIA</b>		
Peoria (C) -----	Paul S. Pender	1916 Edison Ave.	Altoona (C) -----	Walter Bracken	Leechburg
Rockford (C) -----	L. B. Van Nuys	238 So. Jefferson Ave.	Allegheny Valley -----	E. G. Jackson	12 West Third Street
Springfield (C) -----	Donald Johnson	106 North Second St.	Allentown (C) -----	E. W. Weaver	805 Chew St.
Wheaton (C) -----	A. D. Birnbaum	916 West Cook St.	Easton (L) -----	H. Clark Kreider	Arcade Bldg., Center Sq.
	E. C. Krage	133 West Front St.	Erie (C) -----	R. D. Goff	11th and French Sts.
<b>INDIANA</b>			Philadelphia (C) -----	M. G. Sellers	1202 Locust Street
Lake County (C) -----	A. R. Irwin	Kennedy & Summer Blvd., Hammond	Pittsburgh (C) -----	D. A. Fleming	518 Empire Bldg.
Indianapolis (L) -----	A. W. Kruege	2405 E. Tenth St.	Wilkes-Barre (L) -----	Leon N. Sell	Town Hall
Michigan City (C) -----	Walter A. Sassodeck	913 Franklin St.	<b>RHODE ISLAND</b>		
Muncie (C) -----	Harry McCullough	113 W. Howard St.	Providence (C) -----	H. E. Batman	36 Exchange Place
South Bend (C) -----	R. A. Frink	1338 Howard St.	<b>SOUTH CAROLINA</b>		
<b>IOWA</b>			Charleston (L) -----	J. P. Connolly	141 Meeting Street
Cedar Rapids (C) -----	H. E. Neff	94 First Ave., West	<b>SOUTH DAKOTA</b>		
Davenport (C) -----	Louis F. Cory	510 Brady St.	Sioux Falls -----	H. W. Claus	326 S. Phillips Ave.
Davenport (L) -----	H. Heysinger	Davenport Cont. Co.	<b>TENNESSEE</b>		
Des Moines (C) -----	Floyd J. Mockley	308 S & L Bldg.	Chattanooga (L) -----	P. W. Curtis	725 Walnut Street
Fort Dodge (C) -----	J. A. Paul	16 So. Twelfth St.	Knoxville (L) -----	Jerry G. Cason	303 West Church St.
Sioux City (C) -----	E. A. Arzt	211 Fifth St.	Memphis (L) -----	J. J. Brennan	179 Madison Ave.
Waterloo (C) -----	R. A. Cole	Cole Bros. Elec. Co.	Nashville (C) -----	J. T. Shannon	c/o Electric Equip. Co.
<b>KANSAS</b>			Nashville (L) -----	F. H. Tathwell	Nashville Ry. & Lt. Co.
Salina (C) -----	C. G. Loomis	814 Cedar St.	<b>TEXAS</b>		
Wichita (C) -----	P. W. Agreliaus	Wichita	Beaumont (C) -----	J. A. Solleder	Houston & Bolivar Sts.
<b>KENTUCKY</b>			Dallas (C) -----	P. B. Seastrunk	2032 Commerce St.
Lexington (C) -----	J. H. Brock	235 East Main St.	Houston (C) -----	J. A. Kibbler	
Louisville (C) -----	F. Sherman Voght	Kenyon Bldg.	<b>UTAH</b>		
Paducah (L) -----	K. H. Knapp	c/o Paducah Electric Co.	Ogden -----	B. Kristofferson	2249 Washington Ave.
<b>LOUISIANA</b>			Salt Lake City (C) -----	R. E. Folland	Newhouse Hotel
New Orleans (C) -----	I. G. Marks	626½ Carondelet St.	<b>VIRGINIA</b>		
Shreveport (C) -----	R. L. Norton	620 Marshall St.	Norfolk (L) -----	A. W. Cornick	200 Plum St.
<b>MARYLAND</b>			Richmond (C) -----	E. M. Andrews	15 N. Twelfth Street
Baltimore (C) -----	A. P. Peterson	515 Cathedral St.	<b>WASHINGTON</b>		
Baltimore (C) -----	F. C. Claggett	Park Heights Ave.	Seattle (L) -----	P. L. Hoadley	Seaboard Building
Baltimore (C) -----	Geo. Robertson	Park Bank	Spokane (C) -----	William Stack	W. 1121 Cleveland St.
Baltimore (C) -----	W. D. Young	Calvert & Franklin Sts.	<b>WEST VIRGINIA</b>		
<b>MASSACHUSETTS</b>			Wheeling -----	Peter J. Erb	1414 Eoff Street
Boston (L) -----	Edward G. Jay	164 Federal St.	<b>WISCONSIN</b>		
Boston (C) -----	Charles A. Rounds	550 Massachusetts Ave.	Green Bay (C) -----	V. E. Grebel	531 S. Broadway
Cambridge (C) -----	John L. Winn, Jr.	79 Middle St.	Madison (C) -----	Carl J. Marsh	710 Beaver Bldg.
Lowell (C) -----	George A. Ryan	14 West St.	Milwaukee (C) -----	E. H. Herzberg	1604 Wells St.
Haverhill (C) -----	H. W. Porter	c/o Malden Electric Co.	Milwaukee (L) -----	J. S. Bartlett	443 Commerce Bldg.
Malden (Medford, Everett and Melrose) (C) -----	H. J. Walton	220 Dwight St.	Racine (C) -----	Joseph J. Small	1910 Linden Ave.
Springfield (C) -----	C. S. Foster	280 Main St.	<b>CANADA</b>		
Worcester (L) -----	E. B. Coglin	112 Madison Ave.	Montreal (C) -----	George C. L. Brassart	674 Girouard Ave.
<b>MICHIGAN</b>			Toronto (C) -----	J. A. McKay	302 Excelsior Life Bldg.
Detroit (C) -----	N. J. Biddle	1118 Wealthy St., S. E.	Vancouver (C) -----	J. C. Reston	579 Howe St.
Grand Rapids (C) -----	T. J. Haven	1121 Seminary St.	Vancouver -----	J. Galloway	744 Hastings St. W.
Kalamazoo -----	E. R. Hummel	1138 3rd Street	Winnipeg (C) -----	Fred Ball	300 Princess St.
Muskegon (C) -----	Wm. Steiner	209 Brewers Arcade	Winnipeg -----	D. O'Toole	Northern Elec. Co.
Saginaw (C) -----	E. T. Eastman	c/o Minn. Pow'r & Lt. Co.			
<b>MINNESOTA</b>					
Duluth (L) -----	Morris Braden	209 Globe Building			
Minneapolis (C) -----	W. I. Gray	City Bank Bldg.			
<b>MISSOURI</b>					
Kansas City (C) -----	Walter C. DeBolt	120 No. Second St.			
St. Louis:					
Electragists' Ass'n (C) -----	W. F. Gerstner	Railway Exchange Bldg.			
Electric Employers' Association (C) -----	A. W. Van Nort				

(C) designates exclusively Contractor-Dealer organization.  
(L) designates an Electrical League.

# MAY ACTIVITIES

## Famous Speakers to Address Electragists

Leaders of the Electrical Industry and Important Men  
With Particularly Valuable Messages from Other  
Industries Will Speak at Convention

**T**HE list of speakers for the annual convention of the Association of Electragists International reads like an industrial "Who's Who." When 2,000 electrical men from all parts of the United States gather at the Hotel Stevens, Chicago, on August 6-10, they will have an unusual opportunity to secure the national viewpoint on such important questions as:

Central Station-Contractor-Dealer Relations.

Status of the Merchandiser.

Wiring Development.

Motor Distribution.

Credit and Credit Policies.

National Electrical Code.

Licensing and Enabling Acts.

Inter-Industry Partnership.

The New Co-operation.

The program tentatively announced by Laurence W. Davis, general manager of the Association of Electragists, will be as follows:

Monday, August 6: All-day golf tournament, ladies and men. Evening, cards and dancing, The Stevens.

Tuesday, August 7: Morning, opening of Manufacturers' Exhibition. Afternoon, opening business session for electragists; action upon changes in Constitution and By-laws to give chartered local associations direct voice in A. E. I. management, and other important legislation. Evening, theater party.

Wednesday, August 8: Morning, general convention session. Afternoon, electragists' session for contractor-dealers; labor sections meetings. Evening, general assembly, followed by dancing and cabaret.

Thursday, August 9: morning, general convention session. Afternoon, recreation. Evening, formal banquet, ball room of The Stevens.

Friday, August 10: Morning, business session; adjournment at 12:30 p. m.

An attractive program for ladies is being worked out by the entertainment committee.

Included among the speakers are the following:

John F. Gilchrist, vice president of the Commonwealth Edison Co., Chicago, Ill., one of the foremost central station executives in the United States.

### Some of the Speakers at Chicago Convention

John F. Gilchrist, vice president, Commonwealth Edison Co., Chicago, Ill.

Professor Philip Cabot, economist, Graduate School of Business Administration, Harvard University.

E. O. Shreve, manager, Industrial Department, General Electric Company.

Frederic P. Vose, secretary, National Electrical Credit Association.

Victor H. Tousley, electrical field engineer, National Fire Protection Association.

J. J. Caddigan, superintendent, Relations with Allied Interests Department, Boston Edison Electric Illuminating Company.

Charles T. Hutchinson, editorial director, Electrical West.

L. K. Comstock, electragist, president of L. K. Comstock and Co., New York City.

H. B. Kirkland, supervisor wiring development, Society for Electrical Development.

His subject will be: "A Midsummer Night's Dream."

Professor Philip Cabot, internationally known economist, a professor of the Graduate School of Business Administration of Harvard University, will speak on the subject: "Are Public Utility Merchandising Methods Fair and in Accordance With Best Business Practice."

E. O. Shreve, manager, Industrial Department, General Electric Company, with national manufacturers experience in merchandising and distributing electrical motors and other industrial equipment, will speak on the topic: "Some Thoughts on Motor Distribution."

Frederick P. Vose, secretary, National Electrical Credit Association, will address the convention on the subject of Credit and Credit Policies.

Victor H. Tousley, electrical field engineer, N. F. P. A., and recently chief electrical inspector of Chicago, Ill., will

talk on "The Present Trend of the National Electrical Code." Mr. Tousley has been in intimate contact with Code workings, both in assisting in the creation and change of Code articles and in the enforcing of Code provisions as an inspector.

J. J. Caddigan, superintendent, Relations with Allied Interests Department, Edison Electric Illuminating Co., Boston, Mass., will tell about his company's plan of partnership with contractor dealers which has been working successfully, both for the contractors and for the central station.

L. K. Comstock, member of the Executive Committee, Association of Electragists, International, will speak on the subject of "The New Cooperation". Mr. Comstock is one of the best known electrical contractors in the country, the A. E. I. national councillor to the U. S. Chamber of Commerce; chairman of arbitration committee and member of Executive Committee of the Building Congress of N. Y. and was a delegate from the Merchant's Association of N. Y. to the International Chamber of Commerce convention at Stockholm last summer.

Charles T. Hutchinson, editorial director, Electrical West, will tell "What Fraternity Means to the Electrical Industry in California".

H. B. Kirkland, supervisor wiring development, Society for Electrical Development, is an authority on codes and ordinances, and has recently toured the United States making addresses on this subject. His subject will be: "State Enabling Acts and Licensing."

### Who Runs Your Business?

Laurence W. Davis, general manager, Association of Electragists, International, told members of the Independent Associated Electrical Contractors' organization of New York that contrac-



tors who allow competition to decide their prices are not running their own businesses. "Who Runs Your Business?" was the subject of the address, made at the regular monthly meeting on May 9.

According to Mr. Davis, the contractor who sets his prices in accordance with those of his competitors is permitting his rivals to run his business. The bad competitive condition in the industry can be improved, he said, by cooperation, by national representation, by voices raised in effective protest.

A. Lincoln Bush and Louis Freund made informal addresses discussing contractor problems. Plans were laid for a large attendance of New York City contractors at the New York State convention in Rochester.

### Electrical Committee Acts on Code

The members of the electrical committee met in Atlantic City May 3 to go over the tentative version of the new 1928 Code. So many changes were made that they are now being reprinted and will be mailed to members of the electrical committee for final vote. After acceptance, the directors of the National Fire Protection Association will pass on the Code and if it is approved, as is practically certain, the Code will be sent to the June meeting of the American Engineering Standards Committee for approval.

### Revisions to Building Exits Code

Two interesting revisions to the Building Exits Code were considered at the annual meeting of the National Fire Protection Association May 7-10, 1928. One, applying to fire alarm systems, was as follows:

"2576. A fire alarm system conforming to the requirements of Section 10, shall be installed for every place of public assembly having a capacity of 500 or more persons, if on a ground floor, or of whatever capacity if on other than a ground floor. Theaters equipped with movable scenery shall have alarm sending stations on both sides of the proscenium wall in locations designated or approved by the enforcing authority, and in districts served by municipal fire alarm telegraph systems the signaling devices shall conform to and be connected with

such system in accordance with Sections 1018 and 1019."

The other reads:

"Exit Lighting and Signs. 2578. Places of public assembly shall have exit lighting and signs conforming to the requirements of Section 12. Yards, courts and passages outside of and leading away from exit doors, shall have illumination of not less than two hundredths (.02) foot candle for a distance of 50 feet from such doors or outlets."

### New Jersey Organizes Association

The organization of the New Jersey Association of Electrical Contractors and Contractor-Dealers was determined upon at a meeting of electrical contractors from many parts of the State, held at Newark on April 26.

The purpose of this State Association was announced as the bringing together of the eight or ten county associations now organized and operating and to assist in organizing similar local and county associations in each of the twenty-one counties in the State.

The management of the New Jersey

Association will be in the hands of delegates from each county of the State represented, so that a uniform high standard of electrical installation and business ethics may be developed throughout the State.

Temporary officers elected to serve until the next meeting of the Association in July, at which time permanent organization will be adopted, are as follows: President, J. Howard Blackman, Atlantic City; first vice president, Walter J. Coleman, Jersey City; second vice president, Frank Eich, Middlesex; treasurer, C. N. Taylor, Linden; secretary, William A. Shaw, Newark.

It is expected that a full time State field man will be employed to assist in the organization and development of the various county associations.

### Binghamton Adopts Red Seal

Members of the Electrical League of Binghamton, N. Y., voted May 11 to take on the Red Seal Plan and subscribed an initial amount to put the activity in operation. B. Badrian, wiring supervisor of the Society for Electrical Development, addressed the meeting.

## Women's Entertainment Committee

1928 Convention, Association of Electragists, International



Seated, left to right: Mrs. J. N. Pierce, Western Springs, Ill.; Miss Elizabeth O'Kelly, Electrical Contractors' Association of the City of Chicago; Mrs. W. E. McCullough, Gary, Ind.; Mrs. A. C. Oltz, Hammond, Ind.; Miss Doris Tuerk, Illinois Electric Co., Chicago, Ill. Standing, left to right: Mrs. Florence Houghton, White City Electric Co., Chicago, Ill.; Mrs. A. L. Evans, Standard Electric Co., Hammond, Ind., Chairman, Arrangements Committee; Miss Alva Larson, Electric Association, Chicago, Ill., Chairman, Women's Entertainment Committee; Miss Ruth Davis, Graybar Electric Co., Chicago, Ill., Chairman, Publicity Committee; Miss Alma Vick, Anaconda Copper Mining Co., Chicago, Ill.; Miss Valene Barden, Edison Electric Appliance Co., Chicago, Ill.; Mrs. Neal Thomson, Oak Park, Ill.; Mrs. J. Walter Collins, Oak Park, Ill.

Names of Committee Members Not on the Photograph: Miss Mary Ambrose, Electric Association, Chicago, Ill.; Mrs. Samuel A. Chase, Mansfield, Ohio; Mrs. P. F. Hensel, Oak Park, Ill.; Mrs. J. O. Kelso, LaGrange, Ill.; Mrs. Wm. McGuineas, Oak Park, Ill.; Mrs. Leo E. Mayer, Lombard, Ill.; Miss Helen Norris, Commonwealth Edison Company, Chicago, Ill.

## Electrical Ordinance for a Small City

Warren, Ohio, Ordinance Provides for Inspection  
Without the Waste of Duplicate Organizations

THE Warren, Ohio, city council has passed an electrical ordinance which becomes effective June 2, with a unique plan which saves considerable money by preventing duplicate inspections. The ordinance provides that the city electrical inspector shall be paid \$1.00 a year and shall be the accredited representative of the Ohio Inspection Bureau. In this manner, the city is able to maintain its regulations with the police power of an official city inspector;

and yet there is only one inspection service, and no wasteful duplication at all.

The ordinance gives all the ordinary police powers of a city inspector to the representative of the bureau, and provides that all inspection fees shall be paid to the bureau for the compensation of the inspector.

H. M. Ward, of the Ohio Inspection Bureau, is to be the first city electrical inspector under the new ordinance.

### Red Seal in Chattanooga

A study of Red Seal homes in the Chattanooga district reveals the number of outlets per home to be 79 on the average, of which 19 are ceiling outlets, 16 are wall lights, 21 are switches, and 22 are convenience outlets. The Chattanooga League has decided to back Red Seal more actively this year than last, and has appropriated the major part of its income for newspaper advertising.

### New York Contractors to Convene

Leaders of the electrical industry have agreed to discuss vital business problems of electrical contractors at the twenty-ninth annual convention in Rochester June 11 and 12, of the New York State Association of Electrical Contractors and Dealers.

Joseph Forsythe, chief underwriter inspector, New York City; Stanley Dennis, Electrical Record; Laurence W. Davis, general manager, Association of Electragists, International; and Frank A. Pattison, engineer, will address the meetings.

Following the convention, many of the delegates will accompany the members of the Rochester Electric League on their annual cruise to Cobourg, Canada, June 12.

Members of the convention committee, in charge of arrangements, are: C. G. Durfee, chairman; T. H. Green, vice chairman, and C. T. Graning, H. F. Janick, G. F. Laube, E. A. Roeser, J. F. Burns, L. R. Rogers, A. L. Bush, S. J. O'Brien, A. A. A. Tuna, and Louis Freund.

### Illumination for Contractors

A short illumination course for electrical contractors was held by the Cincinnati Electric Club on May 7, 8 and 9, under the direction of T. P. Brown. The course included: Fundamentals of illumination, calculation of lighting installations, industrial lighting, color of light, office lighting, store and show window lighting, layout of the average store, characteristics of equipment, how to cash in on the course.

### Lehigh Valley Emblem



Members of the Lehigh Valley, Pennsylvania, Electrical Association, are entitled to use this emblem on their letterheads and in their shops.

### Common Code Violations

Two frequent Code violations discovered in Massachusetts were called to the attention of contractors in a recent bulletin from the office of the State Examiner of Electricians, Boston. According to the bulletin:

"The failure of certain inspectors to insist on strict compliance with the Code will not excuse licensees from same. As an example, some inspectors do not insist on so-called thimbles or bushings for use on armored cable where it enters ordinary wall cases, such as are used for switches or receptacles. Such protection is called for in Rule 701-c, and will be provided whether called for by the inspector or not, unless specifi-

cally prohibited by the local rules and regulations, or by the inspector.

"Another example which has been called to the attention of the examiners is that certain inspection departments have permitted the use of armored cable run concealed in partitions in place of the ordinarily accepted method of running service conduit down the side of the building. This construction is not permitted by the Code and constitutes a fire menace."

### St. Louis Electrical Men Organize

Organization plans for an electrical contractors' association in St. Louis were laid at a luncheon meeting April 17. S. B. Williams, editor, THE ELECTRAGIST, made the principal address on the subject, "The Enemy Within Our Gates." Mr. Williams attacked the spirit of selfishness within the electrical industry which, he said, endangers every effort to set up a strong national sales program. He contended that the electrical industry was engaged in an internal competition instead of recognizing that the real competition was with the automobile, the silk stocking, and other items that are eating into the public's budget. He pointed out that as long as central stations, jobbers, and manufacturers are content to get their business at the cost of the contractor, the industry must be content with a smaller slice of the American dollar.

### Central Station-Contractor Cooperation

Every lighting recommendation prepared by the lighting service department of the Central Hudson Gas and Electric Corporation contains these two paragraphs:

"The recommended equipment may be obtained from the contractor-dealer members of the Electric Service League of (Kingston, Poughkeepsie, Catskill, or whatever territory involved) who are prepared to make an estimate on this installation.

"The Electric Service League of (Kingston, Poughkeepsie, etc.) is an organization of those participating in the various phases of the electrical industry. It is engaged in the development and improvement of service in supplying electricity and electrical apparatus. The contractor-dealer members of the electric service league are: (names)."



## A. L. E. A. Convention, June 11-16

Members of the Artistic Lighting Equipment Association will meet in Chicago June 11 to 16, for the annual convention and lighting equipment exhibition. The meetings will open June 11, with an address by William R. Dawes, president of the Chicago Association of Commerce, and welcoming remarks by George J. Klein, president of the A. L. E. A., and Granville P. Rogers, managing director.

On the following day group meetings of the various branches of the association will be held. Homer J. Buckley, direct mail expert, will address the meeting on June 13, with the subject, "Meeting the Problem of Lower Selling Costs." Other group and business meetings will be held during the week.

## Camp Cooperation in August

Camp Co-operation VIII, the annual conference of representatives of electrical leagues, will be held at Association Island, N. Y., August 2-7, under the auspices of the league council of the Society for Electrical Development. The effort this year will be to emphasize the co-operative work and market promotion features of league work. Addresses and papers will be presented on previous successful league efforts. Programs for the promotion of wiring, lighting, appliance and industrial business will be presented and discussed.

## New Electrical Contractors Association

Thirty electrical contractors of Denver have formed a new Associated Electrical Contractors' group, for the purpose of studying mutual business problems. The following officers were

elected: J. R. Collier, president; C. F. Oehmler, vice president; E. E. Stettler, secretary-treasurer; Board of Trustees, C. F. Oehmler, C. S. Homsher, Theo. Nollenberger, Charles Woodworth, and H. M. Olmstead; committee chairmen, Contractors' Division, M. R. Price; Fixtures, G. A. Sechler; Appliances, Theo. Nollenberger; Estimating, J. R. Collier; City Hall, M. R. Price; Purchasing, C. F. Oehmler; Credit, C. G. Bolibaugh; Labor, C. O. Krause.

## Reinspection Provided in City Ordinance

An interesting provision in the new building code of Kenmore, N. Y., recently passed, provides for inspection and re-inspection of all electrical work in the village by members of the examining board of electricians—a board that includes three electrical contractors, the village electrical engineer, and a member of the Board of Trustees. This section reads as follows:

"Section 18. Members of the Examining Board of Electricians are hereby empowered to inspect all structures within the Village of Kenmore, in which electrical work is being or has been installed at any time subsequent to the first day of May, 1927, to determine whether the electrical contractor shall have complied with the Laws of the State of New York, the Ordinances of the Village of Kenmore and such rules and regulations as said examining board may enact."

The ordinance provides for the examination and licensing of master electricians and a section reads: "Section 9. No such license shall be granted to any person unless he shall prove to the satisfaction of the board that he has an established place for the regular transaction of business."

## Inspector Rulings Co-ordinated

Rulings of inspectors in San Francisco have been made uniform by the publication of a book covering all electrical ordinances, rules, and interpretations for the city of San Francisco. It is a thick, loose-leaf publication to which additional pages can be added from time to time.

The book was prepared after several conferences between representatives of the Electrical Contractors and Dealers Association of San Francisco, and the chief of the Department of Electricity. The reports of these conferences form the basis of the interpretations, being written by the contractors and approved by the inspection department before being distributed to contractors, consulting engineers, and others.

## N. F. P. A. Elects New President

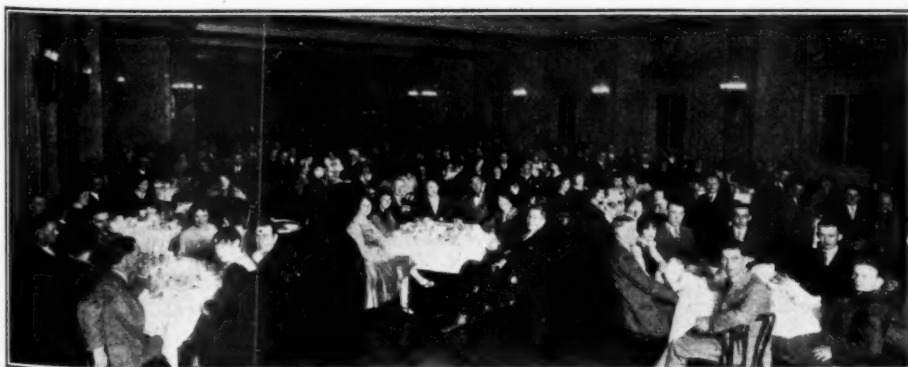
A. M. Schoen, chief engineer, Southeastern Underwriters' Association, Atlanta, Ga., was elected president of the National Fire Protection Association at the annual meeting in Atlantic City, May 5 and 6.

## OBITUARY

### Edwin S. Hulley

Edwin S. Hulley, president of the Hulley Electric Company, Philadelphia, Pa., nationally known as a leader in electrical affairs, died at his home April 23, 1928. Mr. Hulley was very active in organization work, being at the time of his death a member of the board of directors of the Pennsylvania State Association of Electrical Contractors and Dealers.

Mr. Hulley was a former president of the Philadelphia Electrical Contractors' Association, Inc. He was born in Philadelphia. His first electrical work was with the Philadelphia Electric Company, of which he became district manager, serving with this organization for twenty-two years. He then organized his own business, the Hulley Electric Company, electragists, and being intensely interested in association activities he gave freely of his time, his counsel, and advice.



Annual Frolic, Omaha Electrical League, April 24, 1928

### Contractor Dealer Notes

The J. H. Johnson Company, Dallas, Tex., has been awarded the contract for a white way street lighting system in Bristow, Okla., for the amount of \$14,317.66.

A 400-post white way system will be constructed in Poplar Bluff, Mo., at a cost of \$33,000. The contract was awarded to the R. Dron Electrical Co., Madison, Ill.

The Liscum Electrical Company has opened a new store in Center Moriches, L. I., with an appliance and lighting fixture display in the front and a service shop and store room in the rear. Colored spot lights in the windows give good lighting effects on merchandise.

A new electrical contracting concern in San Diego, Calif., was opened recently as the Carl Heilbron Electrical Company, with a policy of 24-hour service for the maintenance and servicing of electrical appliances. Six large lighting fixture display rooms in the store are stocked with fixtures.

The Gruen Electrical Company has been awarded the contract for the installation of radio broadcast equipment for the new municipal convention hall in Atlantic City, N. J., with a bid of \$35,453.

Brownell & Call announced the opening on May 7, of its new electrical store in Claremont, N. H., with a stock of electrical devices, appliances, radios, and accessories.

The Rowley Electric Co., Pasadena, Calif., has moved into its new shop, completely equipped and modern. The store is wired for every electrical convenience to show customers how appliances may be used; one room is an electrically equipped kitchen. A lighting fixture display is laid out on the mezzanine floor. The show window is unique in that there is an invisible skylight directly over it, which tends to offset street reflections. In the rear of the building is the workshop and stock room.

William K. Tuohey, vice president of the Tuohey Electric Co., Springfield, Mass., has been elected president of the local Independence Day association.

L. E. Mayer, president of the White City Electric Co., Chicago, Ill., has been elected to the board of trustees of the village of Lombard, Ill.

Lyman C. Reed, electrical contractor-dealer of New Orleans, La., has been elected president of the New Orleans Electrical League.

The contract for the electrical work on the new Lehigh Country Club, Allentown, Pa., was awarded to the H. N. Crowder, Jr., Co.

Walter H. Taverner, president of the Electrical Contractors' Association, New York City, is organizing a branch of his contracting company in Montreal, Canada, where he has a contract for electrical work for the Bell Telephone Company of Canada.

The remodeled shop of the John H. Pfenninger Co., Lancaster, Pa., has been opened. John A. Lindeman is general manager.

Thompson, Inc., a new electrical shop was opened recently in Greensboro, N. C. The proprietors are Edward A. Thompson and Carl Thompson.

C. C. Koeneman, president of the Koeneman Electric Co., of Jackson, Miss., announces the opening of his new display room and repair shop, with the latest machinery for rewinding of motors, which are handled with a trolley on an I-beam. Equipment for testing motors up to 2,300 volts has also been installed. L. A. Larson, vice president, is in charge of the motor repair shop, John A. Winge is outside construction superintendent, and E. C. Steijen is secretary.

The Shepherd-Rust Company, electragists of Wilkes-Barre, Pa., has moved to a new location, where a specialty will be made of lighting fixtures. The company also conducts a downtown office devoted particularly to illuminating engineering and electric power layouts. G. E. Shepherd, one of the partners, was last year a member of the executive committee of the A. E. I.

## New Electragists

The following contractor-dealers have made application and been accepted into the A. E. I. since the publication of the last list in the May issue:

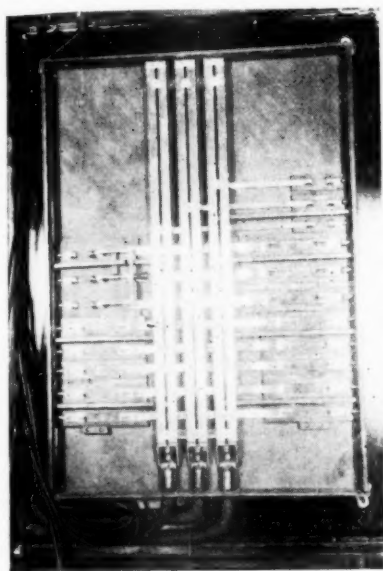
CALIFORNIA	Wheaton:	NEW YORK
Dunsmuir:	A. L. Hawker	Kingston:
Siskiyou Elec. Co.		Canfield Sup. Co.
	INDIANA	William Davis Hawk
GEORGIA	Indianapolis:	New York City:
Atlanta:	T. B. Wright	Dooley Elec. Co., Inc.
Sam Donelson	MARYLAND	OHIO
	Baltimore:	Youngstown:
ILLINOIS	Central Elec. Co.	A. F. Beil Elec. Co.
Chicago:	August A. Flemming	Bermann Elec. Co.
M. N. Murphy	& Sons	Billig Electric
Elmhurst:	The Gay Elec. Co.	Carlson Elec. Co.
Hamilton Pankow Elec-	Wm. F. German & Co.	General Wiring Co.
tric	Luther R. Hubbard	Jones Elec. Co.
Glen Ellyn:	Chas. Jecelin	Petersen Elec. Co.
DuPage Elec. Co.	Albert B. Junkins	Robinson Electric
Glen Ellyn Elec. Shop	Frederick L. Nelson	Spatholt Elec. Co.
	Parthree Elec. Co.	The Standard Chan-
Hinsdale:	DeVane Sibley	delier Co.
Louis H. Dieke	Statter Elec. Co.	Whitstone Elec. Co.
Home Elec. Shop	Henry R. Tieman	Leo J. Witt
	Tucker Elec. Co.	TENNESSEE
Villa Park:	Edward W. Wieward	Chattanooga:
Progressive Elec. Co.	MICHIGAN	Electric Motor Shop
	Grand Rapids:	Johnson City:
	Meyering Elec. Co.	Lyle-Morgan Elec. Co.



# News of the Manufacturers

## Distribution Panel

Lexington Electric Products Co., New York, is introducing a new convertible distribution panel, consisting of a number of 2-phase and 3-phase units of from 30 amp.



to 200 amp. capacity, individually clamped to an ebony asbestos base in such a manner that any unit may be removed or replaced by one of a larger or smaller amp. capacity without disturbing the rest of the panelboard. Two new features are: Each unit takes up no more room on the panel than it would take on an ordinary slate panel; it is only necessary to provide space on the panel for future circuits, thus avoiding guess work as to the sizes of the spare circuits.

## Magnetic Switch

General Electric Co., Schenectady, N. Y., announces a new magnetic switch suitable for throwing squirrel cage motors directly across the line, or for use as a primary switch for a wound rotor motor the secondary of which is handled by a drum controller.

## Glass Cover

Benjamin Electric Mfg. Co., Chicago, Ill., has developed a light weight glass cover for industrial lighting equipment, designed to prevent dust and dirt from manufacturing operations getting into the unit. Features of the new cover are the light weight and the method of attachment, which is effected by slipping the retaining band over the bead of the reflector and snapping locking lever into position.

## Inspection Light

A new hand portable light designed especially for very close inspection work, is announced by Benjamin Electric Mfg. Co., Chicago, Ill. When held close to the surface to be inspected the light provides a bright spot of illumination sufficient to show up imper-

fections in finish or texture. The light weighs two and one-half pounds and is operated by a thumb switch in the handle, which automatically breaks the circuit when thumb is removed. The reflector is of aluminum, with a highly polished reflecting surface; there is a glass cover, with a felt gasket, held by a steel spring.

## Electrical Safety Pilot

Gas-Gard Co., 375 East Main St., Rochester, N. Y., announces an electrical safety pilot as an extra attachment to its system of electrical control for gas water heaters. With the attachment in place, should the gas pilot light be accidentally extinguished, or should the gas supply fail, the gas is automatically turned off by the closing of the electric cir-



cuit, and the gas can not be turned on again until the pilot is relighted. Thus dangerous gas can not leak out from the pilot burner. The Gas-Gard electrical control system provides for switches in all parts of the house which may be turned to start the gas heater operating. With the pilot safety attachment, when the pilot is out, the lamps behind the jewels in the various switch plates will not stay lighted. As soon as the pressure of the finger is removed from the button the lights go out—an unmistakable signal that the pilot is out. Thus the new safety attachment not only prevents the leakage of gas but informs people anywhere in the house that the pilot is out.



## Stand Light

Sampson Access System, Inc., Lynn, Mass., announces the addition to its line of adjustable lighting fixtures of a utility stand light for industrial uses. It may be used by maintenance crews since it holds the light to direct the rays in any position. The portable weighs 10 pounds, stands 6 feet 6 inches high. The vertical stem pivots and will maintain any position from vertical to horizontal. It is sold either wired or unwired.

## Blower

An improvement is announced by the Ideal Commutator Dresser Co., Sycamore, Ill., on its combination blower and suction devices,

in that the motor is wound in a new fashion which, according to the manufacturer, gives greater power and durability. The portable blowers are used for cleaning motors, switchboards, panelboards, etc., and are equipped with a 1-3 h. p. air-cooled universal motor, voltages 100 to 275.

## Air-jacketed Motors

Wagner Electric Corporation, St. Louis, has developed an air-jacketed motor for use where dust, fumes and moisture are present. The entire motor is surrounded by a jacket open at both ends, with fan blades on a shaft extension between the sealed motor and its outer



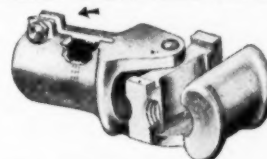
jacket. The only clearance between rotating and stationary parts of the motor is in the bearing housing. The motors are double row, ball bearing, self-aligning in one end plate and deep groove in the other to take end thrust. Bearings are grease lubricated, sealed in dust-proof housing. The shafts are made slightly longer than those for standard motors to permit fan mounting.

## Floodlights

Ochiltree Electric Co., Pittsburgh, Pa., is making a new cove light for use in floodlighting the tops of buildings, especially when they are set back. The lights are set in a trough and come on either 8 in. or 12 in. centers, with or without moulding. Mirrored reflectors, colored lenses, and copper housing, are features. Standard lengths are 8 ft., already wired.

## Conduit Bender

Fullman Mfg. Co., Latrobe, Pa., has put on the market a new hand conduit bender



which may be used for bending either 1-2 inch or 3-4 inch conduit. There is a socket for a 1 inch pipe handle, which clamps on.

## Panelboards

The Penn Electrical Co., Irwin, Pa., has developed a new type of panelboard which is being placed upon the market. The boards are of the molded base unit construction, with fuse blocks separate from the switch bases and the two types of fuse blocks interchangeable, i. e., a panelboard arranged

for cartridge fuses can readily be converted to a plug fused panel-board. Both live face and safety construction boards are available. The molded blocks will take either two double fused circuits or four single fused.

### Electrical Clocks

Tork Clocks, Inc., New York, has placed on the market a line of electrically operated clocks that can be furnished for any voltage, either A. C. or D. C. The line includes wall clocks for stores and offices, double faced hanging clocks, and double faced street clocks; there is a program signal clock for schools, etc.

### Wiring Devices

To meet the demand for lamp holders taking a lamp smaller than the medium base yet larger than the candelabra size, an intermediate line of wiring devices has been produced by The Bryant Electric Company. These sockets, with intermediate screw shells,



can now be secured in the following styles: Brass shell, key, keyless, and pull sockets; composition candle pull sockets, "Templus" pendent weatherproof sockets, porcelain keyless candle sockets and sign receptacles.

### Wiring Devices

To meet requests for wiring devices to be mounted on outlet boxes for exposed wiring in cellars, garages, and other places where appearance is not important, the Weber Electric Co. (Henry D. Sears, sales agent, Boston), has placed several new devices on the market. These include toggle switches, both



single pole three-point, with nickel and porcelain covers; pull and push sockets; box covers with perforated rings. Box covers may be had in either 3 1/4 in. or 4 in. sizes, and in either black enamel, galvanized, or brass lacquer finish.

### Transformer

The A. E. Rittenhouse Co., Honeoye Falls, N. Y., has secured a patent on a new outlet box type transformer, made to fit either a 3 1/2 in. or 4 in. round, octagon, or square box, in black or galvanized finish. Certain manufacturers will be licensed to make this transformer under the patent.

### Torch

The Alexander Milburn Co., Baltimore, Md., announces the development of a new combination cutting and welding torch, which can be changed from a cutting to a welding tool by a slight turn of the tip, modifying the amount of oxygen and gas which is conveyed to the flame.

### Die Stocks

The Borden Co., Warren, Ohio, has put on the market two new self-contained and ad-

justable 1 to 2-in. die stocks, which are lighter in weight and simpler in construction. One set of dies may be set to thread 1, 1 1/8, 1 1/2, or 2-in. pipe without changing dies. The die head and threaded barrel are two separate parts. The pipe gripping device is designed to center the pipe.

### New Catalogs

The Trico Fuse Mfg. Co., Milwaukee, has published a new bulletin on its renewable fuses, containing engineering data and tests on overload time-lag and watt loss saving.

Martindale Electric Co., 1267 West 4th St., Cleveland, Ohio, announces a new 36-page catalog on motor maintenance equipment, illustrating and describing many new products and several improvements.

R. H. Green, of Oakland, Calif., has issued a new catalog and price list of ground clamps, reducing washers, knockout seals, pipe straps, anchor bolts and conduit closers.

Murlin Mfg. Co., Philadelphia, Pa., has published a new catalog of cast iron and bronze exterior lighting equipment, including all the new numbers added during the past year as well as the standard line.

Two new booklets have been published by Holophane Co., New York, one on "Modern Retailing Success" dealing with the subject of store and window lighting and the other on "Lighting Specifics for Gasoline Filling Stations" giving information on industrial units for these buildings.

Bryant Electric Co. has published an interesting booklet entitled "The Home of Ideas," which gives suggestions and sketches of the various rooms of a home, showing where wiring devices should be located. One



idea is an arrangement of warning lights in one of the front hall stair risers, which shows the last person going to bed that a light somewhere downstairs is still on.

A. W. Kakitty has joined the illuminating engineer department of Benjamin Electric Mfg. Co., Chicago.

Wadsworth Electric Mfg. Co., Covington, Ky., has issued new bulletins as follows: One on 3-phase, 4-wire Wadsworth switches; one

on accessible fuse switches and one on branch circuit cabinets, floor and surface types.

Crouse-Hinds Co., Syracuse, N. Y., has published a new catalog of traffic signal lights which are automatically operated, designed for use in isolated but dangerous intersections. This company has also issued a bulletin on floodlights and industrial lighting units.

### Personnel Items

Gordon E. Bloom has been appointed field sales director of the refrigerator division of Benjamin Electric Mfg. Co., Chicago, Ill.

E. D. Pike has been appointed manager of the San Francisco branch sales office of the Wagner Electric Corp. Mr. Pike has been with this company for 26 years.

Zenith Electric Co., Chicago, has appointed two new distributors: A. Hopkin Jr., Co., 235 South Eighth St., Philadelphia, Pa., and F. X. Cleary of 136 Liberty St., New York City.

### Manufacturers' Notes

L. J. Wing Mfg. Co., manufacturers of forced draft blowers, fans and exhausters, has moved its general office to 154 West 14th St., New York City.

The Royal Switchboard Co., 174 East 74th Street, New York City, of which H. I. Emanuel is president, has purchased the business of the Electric Specialty and Switch Co.

Wagner Electric Corp. announces the removal of the New York branch sales office to Suite 1110, 30 Church St. The New York service station remains at 321 West 54th St.

The Minerallac Electric Co. has moved to a new office and factory at 25 North Peoria St., Chicago.

Superior Supply Co., Blufffield, W. Va., has been appointed sales representative for the Ideal Commutator Dresser Co., in the Bluefield territory.

Hatheway & Co., New York, has moved to larger quarters at 225 Varick St. This company is national distributor for Rattan Mfg. Co., Clifton Conduit Co., A. E. Rittenhouse, Clifduct Co., and Superduct Co., as well as local distributor for the Wirt Co., Royal Electric Co., and Heinemann Electric Co.

American Electric Switch Corp., Minerva, Ohio, has added another building to its Minerva factory. The switchboard, panelboard, knife switch, and shipping departments will occupy the new addition.

Safety Cable Co., announces the appointment of Merritt L. Tice, formerly connected with the Benjamin Electrical Mfg. Co., as representative in the southeast.

Trico Fuse Mfg. Co., announces the removal of the Pittsburgh office to new quarters at 405 Penn Ave. William A. Bittner is the manager.

The Times Appliance Co., 33 West 60th St., New York, and 166 Atlantic Ave., Brooklyn, has been appointed agent jobber for the Westinghouse Electric & Mfg. Co.